

Alcatel-Lucent 1665

Data Multiplexer (DMX) | Release 9.1

User Operations Guide

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Federal Communications Commission (FCC) Part 15 Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protections against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's expense.

Security statement

In rare instances, unauthorized individuals make connections to the telecommunications network through the use of remote access features. In such an event, applicable tariffs require that the customer pay all network charges for traffic. Alcatel-Lucent cannot be responsible for such charges and will not make any allowance or give any credit for charges that result from unauthorized access.

Limited warranty

Alcatel-Lucent provides a limited warranty for this product. For more information, consult your local Alcatel-Lucent customer support team.

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About this document

Purpose

This *User Operations Guide* provides the detailed procedural information for the Alcatel-Lucent 1665 Data Multiplexer (Alcatel-Lucent 1665 DMX), Release 9.1.

Reason for reissue

This document is issued to provide information about Release 9.1 features, including:

- In-service upgrades
  - LNW82 to LNW59 one port upgrade
  - LNW59 to LNW504 one or two port upgrade
  - LNW56, LNW57, LNW58, and LNW502 to LNW504 upgrade
- LNW7 to LNW801 DS1 capacity upgrade
- LNW8 and LNW801 can exist in the same function group
- Change the initial default state of an external timing reference from Auto to IS
- STS-192c cross-connect support
- Bi-directional ALS on LNW63/64/70/74/87/170
- FEC is provisionable on LNW705
- Additional buffer sizes for FE and GigE for LNW63/70/74/170
- In TL1 cut-through, the last TID specified is remembered and used in all subsequent commands in which a TID is not specified.
- Extra traffic on low-speed or high-speed OC-192 BLSRs when the mains are equipped with VLF packs
- Optional OOS check for loopback on Ethernet, PDH and EC-1 signals
- Ethernet loopbacks are allowed even when RCF or FEFI are active
- Microsoft *Windows*® 7 64-bit, support on *WaveStar*® CIT

Safety information

For your safety, this document contains safety statements. Safety statements are given at points where risks of damage to personnel, equipment, and operation may exist. Failure to follow the directions in a safety statement may result in serious consequences.

Intended audience

This *User Operations Guide* is intended primarily for telecommunications technicians and communications network providers.

Procedural information in this document is intended primarily for maintenance, operation, and provisioning personnel responsible for the operation and maintenance of the Alcatel-Lucent 1665 Data Multiplexer.

How to use this information product

This guide includes procedure chapters and supporting information (for example, safety instructions, provisionable parameters, glossary, and index). Refer to the Contents section to locate specific information.

Assumptions

This document assumes that users have an understanding of the following:

- Basic principles of telecommunication transmission
- Common telecommunication and system terminology (a glossary is provided in this document to assist you)
- Test sets and tools used in the telecommunication industry
- Local operations and functional procedures of your company
- Personal computer (PC) operation, common PC terminology, and navigational procedures in a windows-style user interface

Conventions used

The following conventions are used in this document.

- **`This font`** indicates a command.
  Example:
  `ent-user-secu`
- *This font* indicates a document reference.
  Example:
  Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300 (document title and 9-digit ordering number)
- **This font** indicates buttons, icons, or menu items.
  Example:
  Configuration → **Equipment**

- *This font* indicates window names or special emphasis.
  Example:
  The *Configure Equipment* window is displayed.
- **This font** indicates lettering designations on the backplane, shelf, and circuit packs.
  Example:
  Release the **ACO TEST** push button on the SYSCTL circuit pack faceplate when the **8.** disappears in the **IND** display.
- `This font` indicates information that is either output by the system or is displayed on the computer.
  Example:
  The response will be `/* SYSTEM TID: LT-DMXtend */`.
- Blue text indicates hyperlinks (cross-references) to other text in the document or another step in the procedure.
  Example: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)
- Important messages are displayed as follows:

  Important! This is important information.

User interface to system

You will interact with the Alcatel-Lucent 1665 Data Multiplexer using a PC and a windows-based graphical user interface (GUI). The GUI is called the *WaveStar*® Craft Interface Terminal (*WaveStar*® CIT) and permits system operations to be performed (for example, administration, provisioning, and fault management).

Using the *WaveStar*® CIT

Procedures presented in this document expect you to be familiar with the *WaveStar*® CIT and with navigation windows. The windows are designed to be straightforward and to contain all information relating to a particular operation. The procedures presented in this document rely on the information provided in the window displays. Therefore, it is imperative that you read all the information provided in a window before continuing an operational function.

Using procedures

To find instructions for performing a specific job, first determine the procedure category (for example, acceptance or node turn-up). After determining the procedure category, go to the corresponding procedure chapter and find the procedure in the chapter *Contents* table.

The procedures in the following chapters contain step-by-step instructions to accomplish a distinct user job:

- Chapter 2, “Software installation and upgrades, and database backup procedures”
- Chapter 3, “Acceptance procedures”
- Chapter 4, “Install and provision circuit packs/OLIUs procedures”
- Chapter 5, “Node turnup procedures”
- Chapter 6, “System configuration procedures”
- Chapter 7, “System administration procedures”
- Chapter 8, “System performance monitoring procedures”
- Chapter 9, “Network configuration procedures”
- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”
- Chapter 12, “Ring and circuit pack upgrade procedures”
- Chapter 13, “Routine maintenance procedures”

The procedures in Chapter 14, “Supporting procedures”, are referenced from multiple procedures to support a job function you are performing. Proceed to a supporting procedure only when it is referred to by another procedure. Supporting procedures are not to be accessed directly except by very experienced personnel.

Important! Perform all steps in a procedure sequentially, unless that step sends you to another step or procedure.

Unless otherwise instructed, if one procedure sends you to another procedure, you must return to the first procedure after you complete the second. After you have completed the first procedure element, you have finished.

If/Then statements in a procedure

If …/Then … columns in a procedure contain only one condition that is true in a table cell under the If … column. Perform the action in the related table cell under the Then … column. Then continue to the next sequential step or as directed by the action under the Then … column.

Verifying actions

Sometimes you will be asked to verify that actions have occurred. This may take the form of a formal statement with the expected response. At other times, you will be instructed to merely verify that the action occurred. If the expected response is not observed and a specific trouble-clearing reference is not made, reference the *Trouble-clearing procedures* chapter in the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*, to start trouble-clearing.

Related information

The following table lists the documents included in the Alcatel-Lucent 1665 DMX documentation set.

Table 1 Alcatel-Lucent 1665 DMX documentation set

Document number/Comcode	Title
365-372-330	*WaveStar® User Guide*
365-372-300R9.1	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide*
365-372-301R9.1	*Alcatel-Lucent 1665 Data Multiplexer (DMX) User Operations Guide*
365-372-302R9.1	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide*
365-372-304R9.1	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual*
365-372-306R9.1	*Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details*
ED8C871-10	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Engineering and Ordering Information*
ED8C871-20	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Interconnect Information*
109783647	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Release 9.1.0 Customer Release Notes* (PDF)
109783274	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Release 9.1.0 Customer Release Notes* (CD-ROM)
109783282	*Alcatel-Lucent 1665 Data Multiplexer (DMX) Release 9.1.X Customer Documentation CD-ROM*

Technical support

For technical support, contact your local Alcatel-Lucent customer support team. See the Alcatel-Lucent Support web site (http://alcatel-lucent.com/support/) for contact information.

How to order

To order Alcatel-Lucent documents, contact your local sales representative or use Online Customer Support (OLCS) (http://support.alcatel-lucent.com).

How to comment

To comment on this document, go to the Online Comment Form (http://infodoc.alcatel-lucent.com/comments/) or e-mail your comments to the Comments Hotline (comments@alcatel-lucent.com).

1 Safety

Overview

Purpose

This chapter provides important safety instructions for Alcatel-Lucent 1665 DMX.

Contents

Structure of safety statements	1-2
General notes on safety	1-4
Laser safety	1-6
Electrostatic discharge	1-26
Save these safety instructions	1-29
Eco-environmental statements	1-32

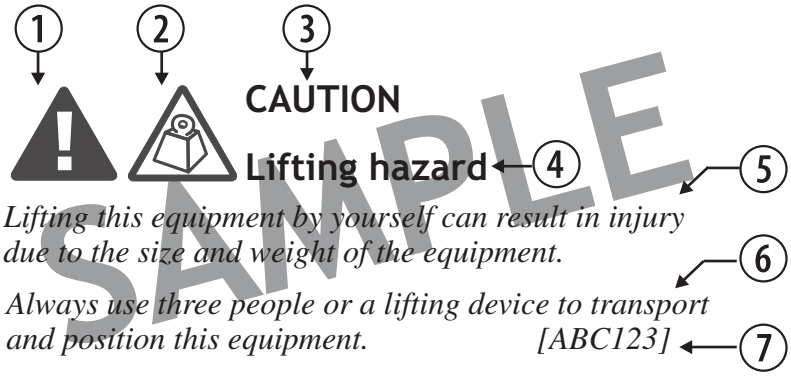
Structure of safety statements

Overview

This topic describes the components of safety statements that appear in this document.

General structure

Safety statements include the following structural elements:



SAMPLE

Item	Structure element	Purpose
1	Safety alert symbol	Indicates the potential for personal injury (optional)
2	Safety symbol	Indicates hazard type (optional)
3	Signal word	Indicates the severity of the hazard
4	Hazard type	Describes the source of the risk of damage or injury
5	Safety message	Consequences if protective measures fail
6	Avoidance message	Protective measures to take to avoid the hazard
7	Identifier	The reference ID of the safety statement (optional)

Signal words

The signal words identify the hazard severity levels as follows:

Signal word	Meaning
DANGER	Indicates an extremely hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazardous situation not related to personal injury.

General notes on safety

Overview

All responsible technical personnel *must* read this chapter before servicing the system. Always keep the most recent issue of this document close to the equipment.

In addition to the general safety instructions in this chapter, users must also observe the specific safety instructions in the individual chapters.

The equipment complies with the current national and international safety requirements. It is provided with a high degree of operational safety resulting from many years of development experience and continuous stringent quality checks.

Potential sources of danger

The equipment is safe in normal operation. However, some potential sources of danger cannot be completely eliminated. In particular, these may arise during the following operations:

- Opening of housings or equipment covers
- Manipulation of any kind within the equipment, even if it has been disconnected from the power supply
- Disconnection of optical or electrical connections
- Through possible contact with live pairs, laser light, hot surfaces, sharp edges, or components sensitive to electrostatic discharge

Special safety instructions

Laser safety and *handling components sensitive to electrostatic discharge (ESD)* are vitally important to the equipment. For special safety instructions concerning laser safety and electrostatic discharge, refer to sections "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26).

General safety requirements

In order to keep the technically unavoidable residual risk to a minimum, it is imperative to observe the following rules.

- Transport, storage, and operation of the unit/system must be under the *permissible conditions only*.

  See accompanying documentation and information on the unit/system.
- Installation, configuration, and disassembly must be performed only by *expert personnel* referring to *the respective documentation*.

  Due to the complexity of the unit/system, the personnel performing installation, configuration, and disassembly require *special training*.
- *Expert* and *authorized users* are required to operate the unit/system.

Operate the unit/system only after having *read and understood* the chapter on safety and the parts of the documentation relevant to operation. For complex systems, additional training is recommended. Any obligatory training for operating and service personnel must be carried out and documented.

- Do not operate the unit/system unless it is in perfect working order.

  Immediately report any faults or errors that might affect safety.
- Operate the unit/system with the proper connections and under the environmental conditions as described in the documentation.
- Only qualified Alcatel-Lucent personnel or expert personnel authorized by Alcatel-Lucent are permitted to perform conversions or changes to the system or parts of the system (including the software).

  All changes performed by other persons lead to a *complete exemption from liability*.

  Do not use components or spare parts that are not recommended by the manufacturer and those not listed in the procurement documents.
- Only *specially qualified personnel* are permitted to remove or disable safety facilities, clear faults and errors, and maintain the equipment.

  Strictly observe the respective parts of the documentation, and consult the documentation during the selection of measurement and test equipment.
- Document and archive all work related to calibrations, special tests after repairs, and regular safety checks.
- Use non-system software at your *own risk*. The use/installation of non-system software can adversely affect the normal functioning of the unit/system.

Laser safety

System compliance

Alcatel-Lucent 1665 DMX complies with the following laser safety regulations and standards:

- Alcatel-Lucent declares that Alcatel-Lucent 1665 DMX contains as Class 1M laser products are certified under the International Electrotechnical Commission (IEC) standards IEC 60825-1 Edition 1.0 and its amendment 1 (1997) and amendment 2 (2001) and IEC 60825-2 Edition 3.1 (2007). It is a Class I/1 laser optical fiber communication systems “product” under the IEC classification.
- Alcatel-Lucent declares that Alcatel-Lucent 1665 DMX contains as Class 1M laser products that are certified under the CENELEC standards EN 60825-1 Edition 1994 and its amendment 1 (2002) and amendment 2 (2001) and IN 60825-2 Edition 2004.
- Alcatel-Lucent declares that Alcatel-Lucent 1665 DMX contains as Class IIIb laser products that are certified under the regulations 21 CFR 1040.10 and 1040.11, which are implemented by the Food and Drug Administration’s Center for Devices and Radiological Health (FDA/CDRH).

This Product is designed to ensure that personnel operating the product are not endangered by laser radiation during normal operation and fault conditions. This product does not present a risk of eye injury because it is fully enclosed and does not contain embedded lasers greater than Class I/1 unless otherwise noted.

The following table shows the optical circuit pack laser safety specifications. The pluggable transmission modules (and the supported circuit packs) are covered in Table 1-2, “Pluggable transmission module laser safety specifications” (p. 1-8).

Table 1-1 Optical circuit pack laser safety specifications

Laser Circuit Pack Code	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
LNW36 OC-3[1]	1310	0.0	Single Mode (9)	LC	I(LN50)/1
LNW46 OC-12[1]	1310	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW48 OC-12	1310	−8.0	Single Mode (9)	LC	I(LN50)/1
LNW50 OC-12	1310	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW54 OC-12	1550	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW26B OC-48[1]	1310	+3.0	Single Mode (9)	LC	I(LN50)/1
LNW27 OC-48	1310	+3.0	Single Mode (9)	LC	I(LN50)/1
LNW28 OC-48[1]	1310	+3.0	Single Mode (9)	LC	I(LN50)/1
LNW29 OC-48	1550	+3.0	Single Mode (9)	LC	I(LN50)/1

Table 1-1 Optical circuit pack laser safety specifications (continued)

Laser Circuit Pack Code	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
LNW31 OC-48	1310	0.0	Single Mode (9)	LC	I(LN50)/1
LNW32 OC-48	1310	+3.0	Single Mode (9)	LC	I(LN50)/1
LNW76 OC-48	1310	−3.0	Single Mode (9)	LC	I(LN50)/1
LNW77 OC-48[1]	1310	0.0	Single Mode (9)	LC	I(LN50)/1
LNW121B–159B OC-48[1]	1550–range	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW221–259 OC-48[1]	1550–range	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW421–459 OC-48[1]	1550–range	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW56 OC-192	1550	+2.0	Single Mode (9)	LC	I(LN50)/1
LNW57 OC-192[1]	1550	+6.0	Single Mode (9)	LC	I(LN50)/1
LNW58 OC-192	1310	−1.0	Single Mode (9)	LC	I(LN50)/1
LNW60 OC-192[1]	1550	+12.5	Single Mode (9)	LC	IIIb/1M
LNW523 OC-192[1]	1550–range	+6.0	Single Mode (9)	LC	I(LN50)/1
LNW527 OC-192[1]	1550–range	+6.0	Single Mode (9)	LC	I(LN50)/1
LNW554 OC-192[1]	1550–range	+6.0	Single Mode (9)	LC	I(LN50)/1
LNW555 OC-192[1]	1533.465	+6.0	Single Mode (9)	LC	I(LN50)/1

Notes:

1. DA'ed and no longer available.

The following table shows the pluggable transmission module (PTM) laser safety specifications and the supported circuit packs. Use only the following Alcatel-Lucent approved Class 1 SFP/XFP transceivers.

Table 1-2 Pluggable transmission module laser safety specifications

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
100BASE-FX-I1	LNW70 LNW74 LNW78 LNW87 LNW170	1310	−14.0	Multimode (50 and 62.5)	LC	I(LN50)/1
100BASE-LX-I1	LNW70 LNW74 LNW78 LNW87 LNW170	1310	−8.0	Single Mode (9)	LC	I(LN50)/1
100BASE-ZX-I1	LNW87 LNW170	1550	+2.0	Single Mode (9)	LC	I(LN50)/1
1000BASE-ZX-I1	LNW63 LNW64 LNW70 LNW78 LNW87 LNW170	1550	+5.0	Single Mode (9)	LC	I(LN50)/1
BASE-T-C1 electrical	LNW63 LNW64 LNW70 LNW78 LNW87 LNW170	NA	NA	NA	RJ45	NA
ESCON-MM-I1	LNW73/73C	1310	−14.0	Multimode (50 and 62.5)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
GE-1X2XFC-LX-I1	LNW63 LNW64 LNW70 LNW73/73C LNW78 LNW87 LNW170 LNW705	1310	−3.0	Single Mode (9)	LC	I(LN50)/1
GE-1X2XFC-SX-I1	LNW63 LNW64 LNW70 LNW73/73C LNW78 LNW87 LNW170 LNW705	850	−2.5	Multimode (50 and 62.5)	LC	I(LN50)/1
OC3IR1-I1	LNW37 LNW45 LNW55 LNW82 LNW705	1310	−8.0	Single Mode (9)	LC	I(LN50)/1
OC3LR1-I1	LNW37 LNW45 LNW55 LNW82 LNW705	1310	0.0	Single Mode (9)	LC	I(LN50)/1
OC-3SR1 (S155I2)	LNW37 LNW45 LNW55 LNW82 LNW705	1310	−8.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
OC3X12X48-IR1-I1	LNW55 LNW82	1310	0.0	Single Mode (9)	LC	I(LN50)/1
OC3X12X48-LR1-I1	LNW55 LNW82	1310	3.0	Single Mode (9)	LC	I(LN50)/1
OC12IR1-I1	LNW49 LNW55 LNW82 LNW203 LNW705	1310	−8.0	Single Mode (9)	LC	I(LN50)/1
OC12LR1-I1	LNW49 LNW55 LNW82 LNW203 LNW705	1310	+2.0	Single Mode (9)	LC	I(LN50)/1
OC12LR2-I1	LNW49 LNW55 LNW82 LNW203 LNW705	1550	+2.0	Single Mode (9)	LC	I(LN50)/1
OC48LR1-I1	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504 LNW705	1310	+3.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
OC48LR2-I1	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504 LNW705	1550	+3.0	Single Mode (9)	LC	I(LN50)/1
OC48SR1-I1	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504 LNW705	1310	−3.0	Single Mode (9)	LC	I(LN50)/1
OC192IR2-C1	LNW59 LNW502 LNW504 LNW603 LNW705	1550	+2.0	Single Mode (9)	LC	I(LN50)/1
OC192IR2-I1	LNW59 LNW705	1550	+2.0	Single Mode (9)	LC	I(LN50)/1
OC192LR2- C1	LNW59 LNW502 LNW504 LNW603 LNW705	1550	+4.0	Single Mode (9)	LC	I(LN50)/1
OC192SR1- C1	LNW59 LNW502 LNW504 LNW603 LNW705	1310	−1.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
S2D23C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1558.983	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D25C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1557.363	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D27C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1555.747	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D31C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1552.524	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D33C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1550.918	+4.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
S2D35C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1549.315	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D37C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1547.715	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D45C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1541.349	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D47C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1539.766	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D49C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1538.186	+4.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
S2D53C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1535.036	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D55C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1533.465	+4.0	Single Mode (9)	LC	I(LN50)/1
S2D59C6 (OC-48/STM–16/ OTU1 DWDM)	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504	1530.334	+4.0	Single Mode (9)	LC	I(LN50)/1
S2G7C47LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1471	+5.0	Single Mode (9)	LC	I(LN50)/1
S2G7C49LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1491	+5.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
S2G7C51LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1511	+5.0	Single Mode (9)	LC	I(LN50)/1
S2G7C53LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1531	+5.0	Single Mode (9)	LC	I(LN50)/1
S2G7C55LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1551	+5.0	Single Mode (9)	LC	I(LN50)/1
S2G7C57LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1571	+5.0	Single Mode (9)	LC	I(LN50)/1
S2G7C59LI (OC48/STM16 CWDM)	VLNC55 VLNC62 LNW82 LNW202 LNW402 LNW504	1591	+5.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
S2G7C61LI (OC48/STM16 CWDM)	LNW82 LNW202 LNW402 LNW504	1611	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C47EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1471	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C49EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1491	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C51EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1511	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C53EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1531	+5.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
S622C55EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1551	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C57EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1571	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C59EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1591	+5.0	Single Mode (9)	LC	I(LN50)/1
S622C61EL (OC-3/STM-1/OC-12/STM-4 CWDM)	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705	1611	+5.0	Single Mode (9)	LC	I(LN50)/1
X10G21C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1560.606	+3.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
X10G22C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1559.794	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G23C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1558.983	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G24C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1558.173	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G25C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1557.363	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G26C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1556.555	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G27C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1555.747	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G28C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1554.940	+3.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
X10G31C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1552.524	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G33C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1550.918	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G35C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1549.315	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G37C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1547.715	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G45C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1541.349	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G47C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1539.766	+3.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
X10G49C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW504 LNW603 LNW705	1538.186	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G52C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1535.822	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G53C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1535.036	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G54C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1534.250	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G55C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1533.465	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G56C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1532.681	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G57C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1531.898	+3.0	Single Mode (9)	LC	I(LN50)/1

Table 1-2 Pluggable transmission module laser safety specifications (continued)

Module Code	Supported Circuit Packs	Wavelength (nm)	Output Power (dBm)	Fiber Type (µm)	Connector Type	FDA Class/ IEC Class
X10G58C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1531.116	+3.0	Single Mode (9)	LC	I(LN50)/1
X10G59C5 (OC-192/STM-64/ OTU2 DWDM)	LNW59 LNW502 LNW603 LNW705	1530.334	+3.0	Single Mode (9)	LC	I(LN50)/1

Notes:

1. DA'ed and no longer available.

General laser information

Optical fiber telecommunication systems, their associated test sets, and similar operating systems use semiconductor laser transmitters that emit infrared (IR) light at wavelengths between approximately 800 nanometers (nm) and 1600 nm. The emitted light is above the red end of the visible spectrum, which is normally not visible to the human eye. Although radiant energy at near-IR wavelengths is officially designated invisible, some people can see the shorter wavelength energy even at power levels several orders of magnitude below any that have been shown to cause injury to the eye.

Conventional lasers can produce an intense beam of monochromatic light. Monochromatic light is a single wavelength output of pure color that may be visible or invisible to the eye. A conventional laser produces a small-sized beam of light, and because the beam size is small, the power density (also called irradiance) is very high. Consequently, lasers and laser products are subject to federal and applicable state regulations as well as international standards for their safe operation.

A conventional laser beam expands very little over distance, or is said to be very well collimated. Thus, conventional laser irradiance remains relatively constant over distance. However, lasers used in lightwave systems have a large beam divergence, typically 10 to 20 degrees. Here, irradiance obeys the inverse square law (doubling the distance reduces the irradiance by a factor of four) and rapidly decreases over distance.

Lasers and eye damage

The optical energy emitted by laser and high-radiance LEDs in the 400 to 1400–nm range may cause eye damage if absorbed by the retina. When a beam of light enters the eye, the eye magnifies and focuses the energy on the retina magnifying the irradiance. The irradiance of the energy that reaches the retina is higher than at the cornea and, if sufficiently intense, may cause a retinal burn.

The damage mechanism at the wavelengths used in optical fiber telecommunications is thermal in origin; for example, damage caused by heating. Therefore, a specific amount of energy is required for a definite time to heat an area of retinal tissue. Damage to the retina occurs only when one looks at the light sufficiently long that the product of the retinal irradiance and the viewing time exceeds the damage threshold. Optical energies above 1400 nm cause corneal and skin burns, but these optical energies do not affect the retina. The thresholds for injury at wavelengths greater than 1400 nm are significantly higher than those for wavelengths in the retinal hazard region.

Classification of lasers

Manufacturers of lasers and laser products in the United States are regulated by the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) under 21 CFR 1040. These regulations require manufacturers to certify each laser or laser product as belonging to one of the following classes: I, II, lla, IIIa, lllb, or IV.

The International Electrotechnical Commission (IEC) is an international standards body that writes laser safety standards under IEC-60825. Classification schemes are similar and divided into Classes 1, 1M, 2, 2M, 3B, 3R, and 4. Lasers are classified according to the accessible emission limits and their potential for causing injury.

Optical fiber telecommunication systems are generally classified as Class I/1, because, under normal operating conditions, all energized laser transmitting circuit packs are terminated on optical fibers which enclose the laser energy with the fiber sheath forming a protective housing. Also, a protective housing/access panel is typically installed in front of the laser circuit pack shelves. The circuit packs themselves, however, may be FDA/CDRH Class I, IIIb, or IV or IEC Class 1, 1M, 3B, 3R, or 4. State-of-the-art Raman and EDFA optical amplifiers have now extended into the Class IV/4 designations.

Laser safety precautions for optical fiber telecommunications systems

In its normal operating mode, an optical fiber telecommunication system is totally enclosed and presents no risk of eye injury. It is a Class I/1 system under the FDA/CDRH and IEC classifications.

The fiber optic cables that interconnect various components of an optical fiber telecommunication system can disconnect or break and may expose people to lightwave emission. Also, certain measurements and maintenance procedures may expose the technician to emission from the semiconductor laser during installation and servicing.

Unlike more familiar laser devices, such as solid-state and gas lasers, the emission pattern of a semiconductor laser results in a highly divergent beam. In a divergent beam, the irradiance (power density) decreases rapidly with distance. The greater the distance, the less energy will enter the eye and the less potential risk for eye injury. If you inadvertently view an unterminated fiber or damaged fiber with the unaided eye at distances greater than 5 to 6 inches, normally, it will not cause eye injury provided that the power in the fiber is less than a few milliwatts at the near IR wavelengths and a few tens of milliwatts at the far IR wavelengths. However, damage may occur if you use an optical instrument such as a microscope, magnifying glass, or eye loupe to stare at the energized fiber end.

Laser radiation



WARNING

Laser hazard

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.

Do not view directly into the laser beam with optical instruments such as a fiber microscope because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.

Never look into the end of an exposed fiber or an open connector as long as the optical source is switched on.

Ensure that the optical source is switched off before disconnecting optical fiber connectors.

Laser safety precautions for enclosed systems

Under normal operating conditions, optical fiber telecommunication systems are completely enclosed. Observe the following laser safety precautions for enclosed systems:

- Because of the potential for eye damage, do not stare into optical connectors or broken fibers.
- Do not under any circumstances perform laser/fiber optic operations before satisfactorily completing laser safety training.
- Since viewing lightwave emission directly in excess of Class I/1 limits with an optical instrument such as an eye loupe greatly increases the risk of eye damage, observe/follow laser safety labels. Appropriate labels must appear in plain view, in close proximity to the optical port on the protective housing/access panel of the terminal equipment

Laser safety precautions for unenclosed systems

During service, maintenance, or restoration, an optical fiber telecommunication system is considered unenclosed. Observe the following laser safety precautions for unenclosed systems:

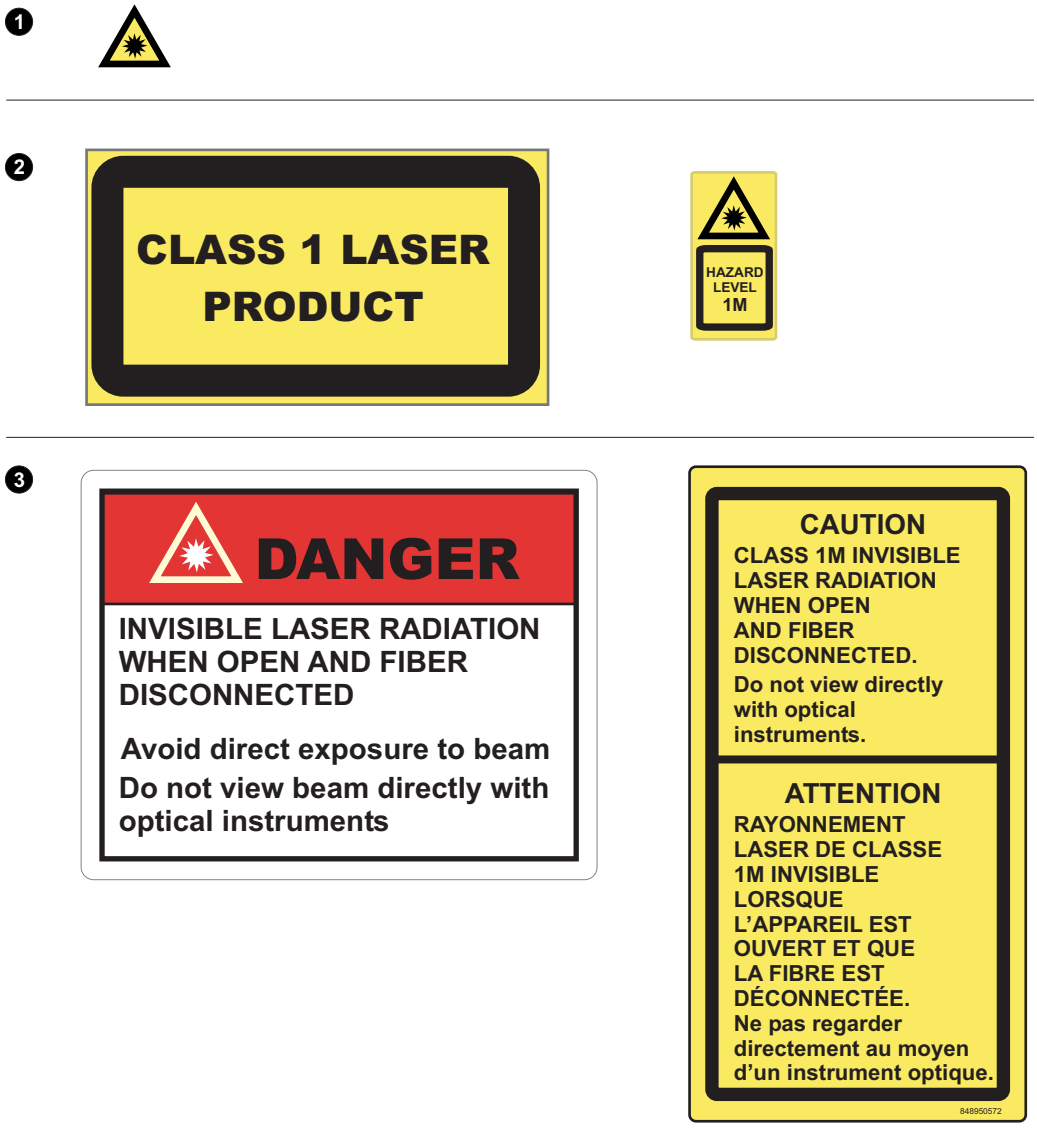
- Only authorized, trained personnel shall be permitted to do service, maintenance, and restoration. Avoid exposing the eye to emissions from unterminated, energized optical connectors at close distances. Laser modules associated with the optical ports of laser circuit packs are typically recessed, which limits the exposure distance. Optical port shutters, automatic power reduction (APR), and automatic power shutdown (APSD) are engineering controls that are also used to limit the emissions. However, do not stare or look directly into the optical port with optical instruments or magnifying lenses when removing or replacing laser circuit packs. (Normal eye wear or indirect viewing instruments, such as a Find-R-Scopes, are not considered magnifying lenses or optical instruments.)
- Only authorized, trained personnel shall use the optical test equipment during installation or servicing since this equipment contains semiconductor lasers. (Some examples of optical test equipment are Optical Time Domain Reflectometers [OTDRs] and Hand-Held Loss Test Sets.)
- Do not, under any circumstance, scan a fiber with an optical test set without verifying that all laser sources on the fiber are turned off.
- Only authorized personnel are permitted in the immediate area of the optical fiber telecommunication systems during installation and service.

For guidance on the safe use of optical fiber optic communication systems in the workplace, consult *ANSI* Z136.2, American National Standard for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diodes and LED Sources in the United States or outside the United States, IEC-60825, Part 2.

Laser warning labels

The following figure shows the different types of laser warning labels:

Figure 1-1 Laser warning labels



MA-DMX-416

Legend

1. Laser symbol

2. Laser classification labels (This label may show only the laser class or both the laser class and the maximum output power.)

3. Laser warning labels

Electrostatic discharge

Overview

Electrostatic discharge (ESD) (for example, caused by touching with the hand) can destroy semiconductor components. The correct operation of the complete system is then no longer assured.

ESD warning



NOTICE

ESD hazard

ESD can destroy electronic components.

Always keep circuit packs in antistatic covers. Use the original packaging if possible*. Use a static ground wrist strap whenever handling circuit packs or working on the Alcatel-Lucent 1665 DMX system to prevent ESD damage to sensitive components.*

All semiconductor components are basically sensitive to ESD. The ESD can also affect the components indirectly.

ESD considerations

This section describes the precautions required to prevent ESD damage.

Circuit pack handling precautions

Industry experience has shown that all integrated circuit packs can be damaged by static electricity that builds up on work surfaces and personnel. The static charges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static charges to accumulate. Higher potentials are measured in areas with low relative humidity, but potentials high enough to cause damage can occur anywhere.

Observe the following precautions when handling circuit packs/units to prevent ESD damage.

- Assume all circuit packs contain solid-state electronic components that can be damaged by ESD.
- When handling circuit packs (for example storing, installing, and removing) or when working on the backplane, always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat.
- Wear working garment made of 100% cotton to avoid ESD.
- Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.

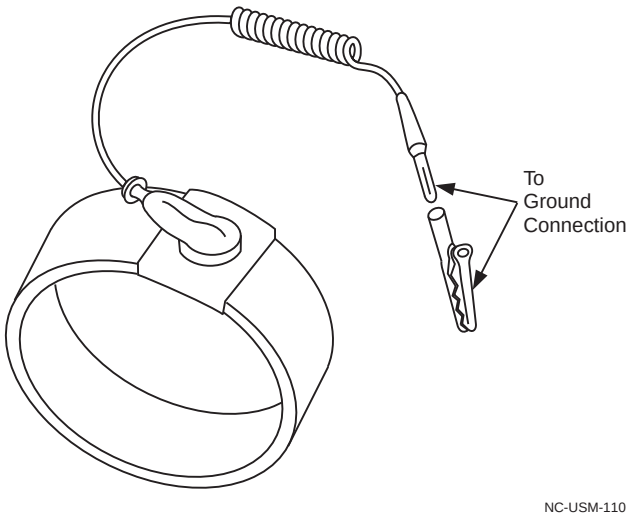
- Store and ship circuit packs and components in their shipping packing. Circuit packs and components must be packed and unpacked only at workplaces suitably protected against build-up of charge.
- Observe all warning labels on bags and cartons. Whenever possible, do not remove circuit packs from antistatic packaging until ready to insert them into slots.
- If possible, open all circuit packs at a static-safe work position, using properly grounded wrist straps and static-dissipating table mats.
- Always store and transport circuit packs in static-safe packaging. Shielding is not required unless specified.
- Keep all static-generating materials such as food wrappers, plastics, and *Styrofoam*® containers away from all circuit packs. When removing circuit packs from a shelf, immediately place the circuit packs in static-safe packages.
- Whenever possible, maintain relative humidity above 20 percent.

  Important! Ensure that any connectors on the shelf interconnection panel that are not cabled are fitted with a plastic dust cap to provide ESD protection.

Static control wrist straps

To reduce the possibility of ESD damage, the Alcatel-Lucent 1665 DMX shelf is equipped with an ESD grounding jack to enable personnel to ground themselves using wrist straps [Figure 1-2, “Static control wrist strap” (p. 1-27)], while handling circuit packs or working on the shelf. Check the wrist straps periodically with a wrist strap tester to ensure that they are working properly.

Figure 1-2 Static control wrist strap



Important! The grounding jack is located on the front of the shelf, on the lower-right corner. Another grounding jack is also located on the rear panel.

Barred-hand symbol

Circuit packs containing components that are especially sensitive to ESD are identified by warning labels bearing the barred-hand symbol. The following figure shows the barred-hand symbol.

Figure 1-3 ESD warning label (barred-hand symbol)



MA-metro-429

Save these safety instructions

READ AND UNDERSTAND ALL INSTRUCTIONS.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying this product.

When installing, operating, or maintaining this equipment, always follow basic safety precautions to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on this product.
3. Operate this product only from the type of power sources that are indicated on the marking label.
4. Connect this product only to the type of power sources recommended by Alcatel-Lucent. For information on the powering instructions, consult the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.
5. This equipment is suitable for mounting on a concrete or other noncombustible surface only. For information on proper mounting instructions, consult the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.
6. Install only equipment identified in the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*. Use of other equipment may result in improper connection of circuitry leading to fire or injury to persons.
7. Ensure that all metallic telecommunication interfaces (traffic ports) that leave the building premises are connected to telecommunication devices that provide primary and secondary protection, as applicable.
8. Do not use this product near water; for example, in a wet basement.
9. Do not place this product on an unstable cart, stand, or table. The product may fall and cause serious damage to the product.
10. Use caution when installing or modifying telecommunications lines.
11. Never install telecommunications wiring during a lightning storm.
12. Never install telecommunications connections in wet locations.
13. Never touch uninsulated telecommunications wires or terminals unless the telecommunications line has been disconnected at the network interface.
14. Never touch uninsulated wiring or terminals carrying direct current or ringing current, and never leave this wiring exposed. Protect and tape uninsulated wiring and terminals to avoid risk of fire, electric shock, and injury to service personnel.

15. Never push objects of any kind into this product through slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquids of any kind on the product.
16. To protect the unit from overheating, slots and openings in the unit are provided for ventilation. Do not block or cover these openings. Do not place this product in a built-in installation unless proper ventilation is provided.
17. To reduce the risk of an electrical shock, do not disassemble this product. Service should be performed by trained personnel only. Opening or removing covers and/or circuit boards may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electrical shock when the unit is subsequently used.
18. Some of the Alcatel-Lucent 1665 DMX family hardware modules contain FDA/CDRH Class IIIb/IEC Class 1M single-mode laser products that are enclosed lightwave transmission systems.

    Under normal operating conditions, lightwave transmission systems are completely enclosed; however, the following precautions must be observed because of the potential for eye damage:

    - Do not stare directly into the optical connectors terminating the cables.
    - Ensure that technicians have satisfactorily completed an approved training course before performing lightwave/lightguide operations.
    - Do not use optical instruments such as an eye loupe to view a fiber or unterminated connector.

    More information about laser safety can be found in the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.
19. For a unit intended to be powered from −48 V DC voltage sources, read and understand the following:
    - Use only Safety Extra Low Voltage (SELV) −48 V DC sources.
    - Disconnect up to two power supply connections when removing power from the system.
    - Provide a readily accessible disconnect device as part of the building installation.
    - Ensure that there is no exposed wire when the input power cables are connected to the unit.
    - Include an independent frame ground drop to building ground. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.

      This electrical ground symbol is marked on the product, adjacent to the ground (earth) area for the connection of the ground (earth) conductor.
    - This equipment is to be installed only in Restricted Access Areas on Business and Customer Premises Applications in Accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA No. 70. Other installations exempt from the enforcement of the National Electrical Code may be engineered according to the accepted practices of the local telecommunications utility.

20. For a unit intended to be powered from 100-120/200-240 V AC voltage sources, read and understand the following:
    - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
    - Do not staple or otherwise attach the power supply cord to the building surfaces.
    - Do not overload wall outlets and extension cords as this can result in the risk of fire or electrical shock.
    - Install the socket outlet near the equipment so that it is readily accessible.
    - This product is equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug is intended to fit only into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug. Do not use a 3-to-2-prong adapter at the receptacle. Use of this type adapter may result in risk of electrical shock and/or damage to this product.
    - Do not allow anything to rest on the power cord. Do not locate this product where the cord may be abused by persons walking on it.
21. Unplug this product from the wall outlet, and refer servicing to qualified service personnel under the following conditions:
    - When the power supply cord or plug is damaged or frayed.
    - If liquid has been spilled into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally by following the operating instructions (Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by qualified technician to restore the product to normal operation.)
    - If the product has been dropped or the cabinet has been damaged.
    - If the product exhibits a distinct change in performance.

SAVE THESE INSTRUCTIONS.

Eco-environmental statements

Overview

The statements that follow are the eco-environmental statements that apply to Alcatel-Lucent 1665 DMX when deployed in the European Union, China, Canada, and the United States.

Packaging collection and recovery requirements

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established.

For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, please contact the Alcatel-Lucent Services - Environmental Health and Safety organization.

Material content compliance

European Union RoHS

European Union (EU) Directive 2002/95/EC, “Restriction of the use of certain Hazardous Substances” (RoHS), restricts the use of lead, mercury, cadmium, hexavalent chromium, and certain flame retardants in electrical and electronic equipment. This Directive applies to electrical and electronic products placed on the EU market after 1 July 2006, with various exemptions, including an exemption for lead solder in network infrastructure equipment. Alcatel-Lucent products shipped to the EU after 1 July 2006 comply with the EU RoHS Directive.

China RoHS

The Peoples Republic of China Ministry of Information Industry has published a regulation (Order #39) and associated standards regarding restrictions on hazardous substances (China RoHS). Currently, the legislation requires all Electronic and Information Products (EIP) to comply with certain labeling and documentation requirements. Alcatel-Lucent products manufactured on or after 1 March 2007, that are intended for sale to customers in the China market, comply with these requirements.

In accordance with the People’s Republic of China Electronic Industry Standard “Marking for the Control of Pollution Caused by Electronic Information Product” (SJ/T11364- 2006), customers may access Alcatel-Lucent’s Hazardous Substances Table information at either of the following two URLs (for the convenience of our diverse customer base):

- Access via the Alcatel-Lucent Corporate website at:

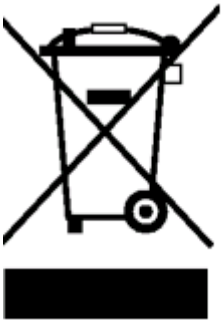
http://www.alcatel-sbell.com.cn/live/home/index.jsp (http://www.alcatel-sbell.com.cn/live/home/index.jsp)

- Access via the Alcatel Shanghai Bell website at:
  http://www.alcatel-sbell.com.cn/wwwroot/images/upload/private/1/media/China-RoHS-HST-3.1.pdf (http://www.alcatel-sbell.com.cn/wwwroot/images/upload/private/1/media/China-RoHS-HST-3.1.pdf)

Recycling / take-back / disposal of products

Electronic products bearing or referencing the symbols shown below shall be collected and treated at the end of their useful life, in compliance with applicable European Union and other local legislation. They shall not be disposed of as part of unsorted municipal waste. Due to materials that may be contained in the product and batteries, such as heavy metals, the environment and human health may be negatively impacted as a result of inappropriate disposal.

Note: For electronic products put on the market in the European Union, a solid bar under the crossed-out wheeled bin indicates that the product was put on the market after 13 August 2005.



Moreover, in compliance with legal requirements and contractual agreements, where applicable, Alcatel-Lucent will offer to provide for the collection and treatment of Alcatel-Lucent products bearing the logo at the end of their useful life, or products displaced by Alcatel-Lucent equipment offers.

For information regarding take-back, recycling, or disposal of equipment by Alcatel-Lucent or for equipment take-back requests, visit the Alcatel-Lucent Take-Back web page (http://www.alcatel-lucent.com/product_takeback) or contact Alcatel-Lucent Takeback Support (takeback@alcatel-lucent.com). For technical information on product treatment, consult the Alcatel-Lucent Recycling Information web page (http://www.alcatel-lucent.com/product_recycling).

2 Software installation and upgrades, and database backup procedures

Overview

Purpose

This chapter includes procedures used to:

- Install a new generic software program
- Download a generic software program
- Copy a generic software program to a remote NE
- Apply (activate) a generic software program
- Backup the network element database
- Restore the network element database

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Before you begin

Before you begin

Before performing procedures in this chapter:

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

The procedures in this chapter require the following equipment:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedure, that additional equipment is listed in that procedure.

Procedure 2-1: Install software generic (initial) via FTAM

Overview

Use this procedure to install the software generic via the File Transfer and Access Management (FTAM) protocol in a factory-fresh LNW2 SYSCTL. A factory-fresh SYSCTL circuit pack does not contain a software generic; it only contains the information loaded at the factory (boot code).

To install the software generic via FTP, refer to Procedure 2-2: “Install software generic (initial) via FTP” (p. 2-31).

Important! You must have OSI connectivity (via your OSI LAN or DCC) to the network element to use FTAM.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to “Required equipment” (p. 2-2) listed in this chapter, the following equipment is also required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port (required for TCP/IP connectivity)
- Copy of the new system generic software program accessible from your PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
- Factory-fresh LNW2, system controller (SYSCTL), with two factory-installed non-volatile memory (NVM) cards installed
- Current *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed

Before you begin

Before performing this procedure:

1. Refer to “Before you begin” (p. 2-2) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.
2. Verify that new software generic program is available.
3. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for a description of any special considerations required when installing this version of software.
4. Unseat all circuit packs in the shelf, except the LNW2 SYSCTL to which you are downloading the new software generic.

Important! This procedure is intended for new shelf installations only. Do not use this procedure to upgrade an in-service shelf.

Steps

Complete the following steps to install the software generic program via FTAM in a new shelf installation with only a factory-fresh LNW2 SYSCTL installed.

1 **Important!** A factory-fresh SYSCTL circuit pack does not contain a software generic; it only contains the information loaded at the factory (boot code).

Verify that only a factory-fresh LNW2 SYSCTL is present in your Alcatel-Lucent 1665 DMX shelf; ensure that no other circuit packs are seated in the shelf. An LNW2 SYSCTL is required to install 9.1.x software; you cannot install 9.1.x into an LNW1 SYSCTL.

2 **Important!** For software installation, ensure that two NVMs are present in the LNW2 SYSCTL.

After the LNW2 is installed, if one or both NVMs are missing, `NVM removed` alarm(s) are issued and:

- If one NVM socket is empty or an NVM is failed, the **IND** displays an alternating **N** and **O** and **x** (x=1 or 2, indicating the offending NVM socket).
- If both NVM sockets are empty, the **IND** displays an alternating **E** and **0** and **1**.

Refer to Step 3 for the complete listing of codes and required actions.

Insert the LNW2 (SYSCTL) circuit pack into the slot labeled **CTL** in the center of the shelf using a steady pressure on both faceplate latches. Allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 10 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and the **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.
4. Continue with Step 3.

3 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
alternating **M** and **P** and **6** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **7** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **7** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **1**	7.1 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **8** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **9** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **9** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **1**	9.1 Maintenance Mode. Continue with Step 4.
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent-supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.

If...	Then...
alternating **E** and **1** and **0**	LNW2 SYSCTL does not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.
alternating **N** and **O** and **x**	"x" indicates that the NVM socket (1 or 2) is empty or the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
Letter **U**	LNW2 SYSCTL does not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

4 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

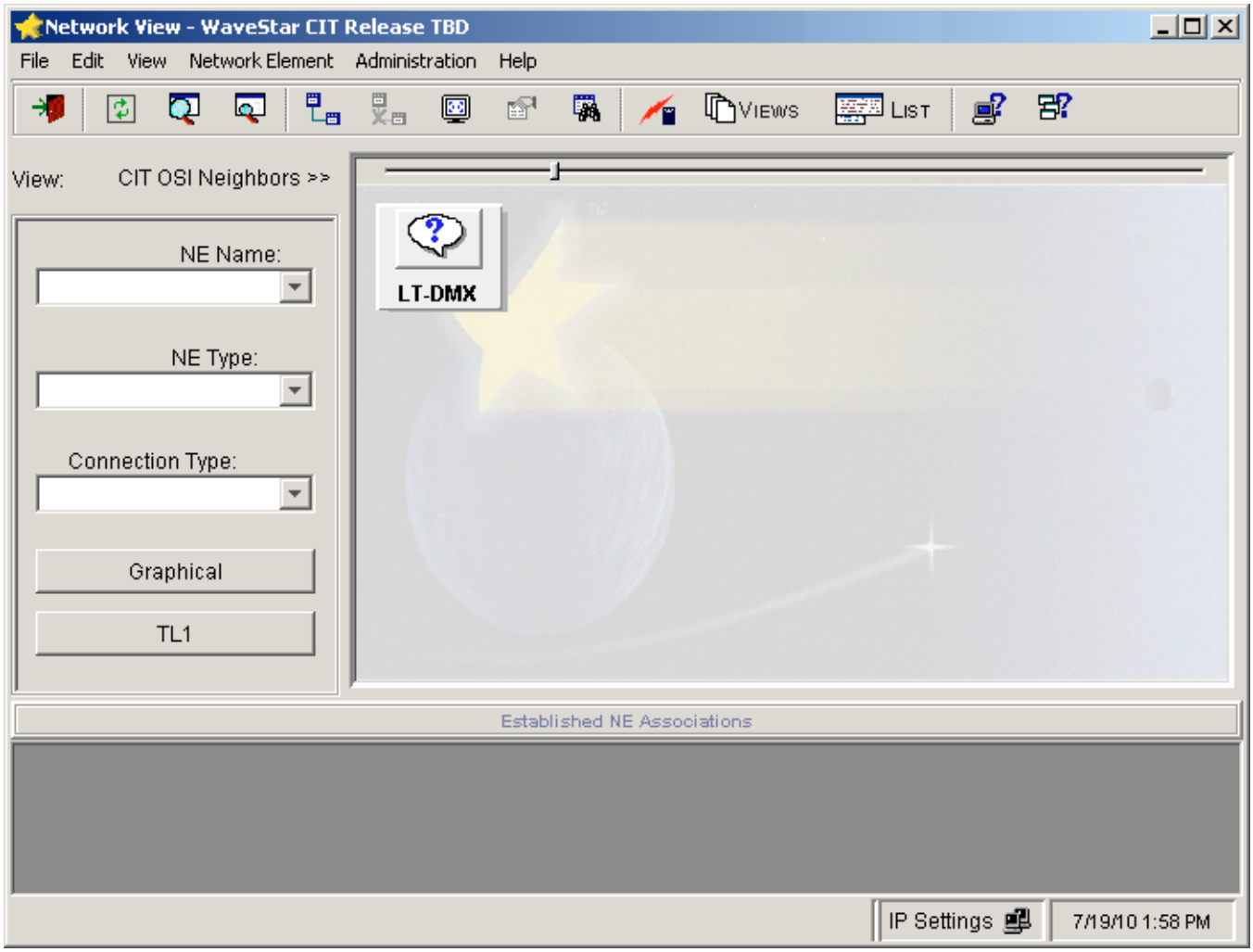
Double-click the *WaveStar*® CIT icon on your desktop and login (if necessary), to start the *WaveStar*® CIT software on the PC. Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

Result: The *Network View* appears.

5 From the **View:** pull-down menu, select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI Neighbor(s) are automatically detected.



6 In the Network View, right-click the LT-DMX NE icon and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

7 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

8 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

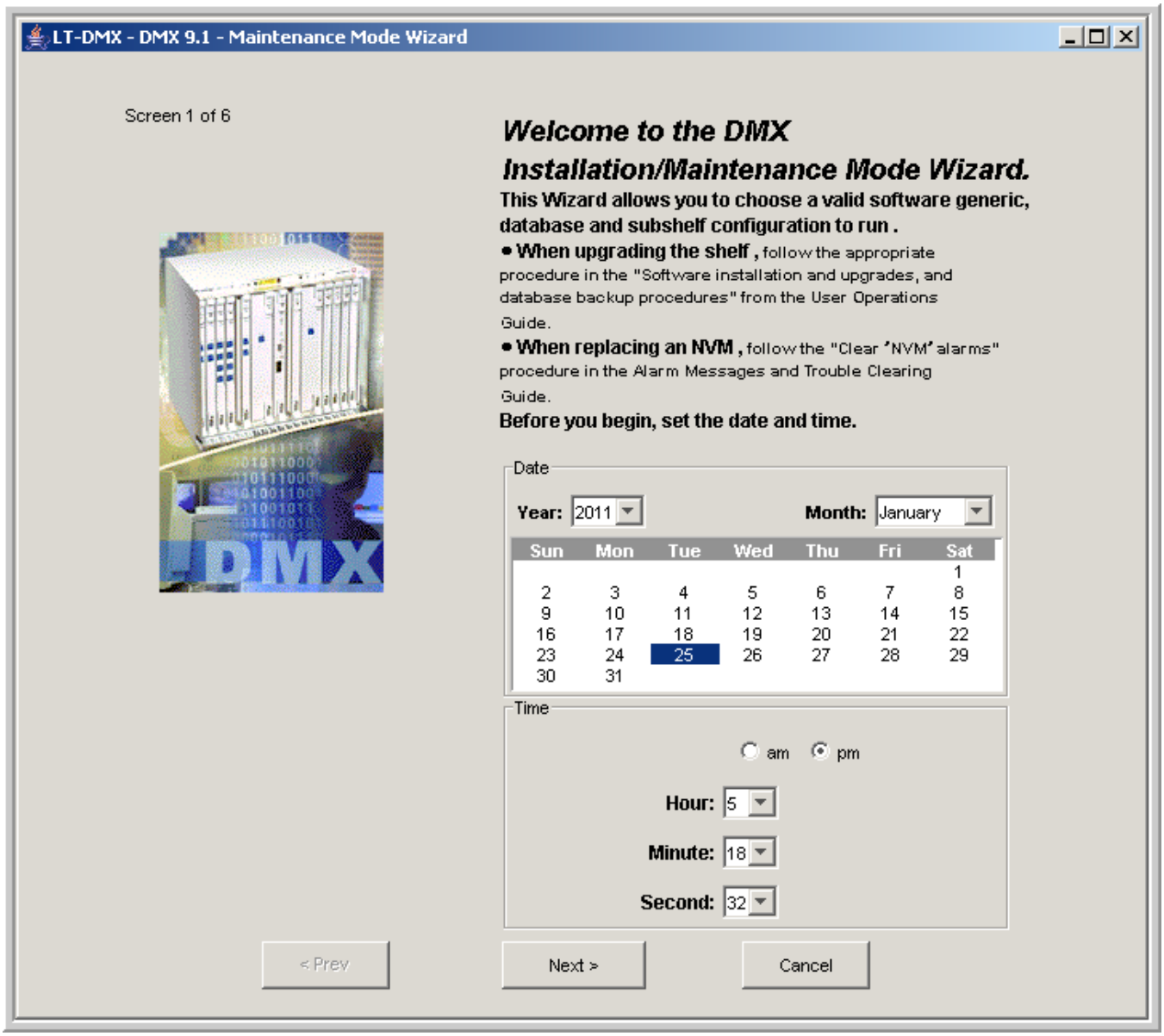
Password: ***DMX2.5G10G***

Click **OK**.

Important! LUC01, LUC02, and LUC03 are the default privileged User IDs, and DMX2.5G10G is the default privileged password for Alcatel-Lucent 1665 DMX. To preserve the security of your equipment, it is highly recommended that you change all three logins and passwords during your first session after completing this initial installation procedure.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 3), the title bar of the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0, DMX 9.0, or DMX 9.1.



This screen picks up the time format preference from the *WaveStar*® CIT.

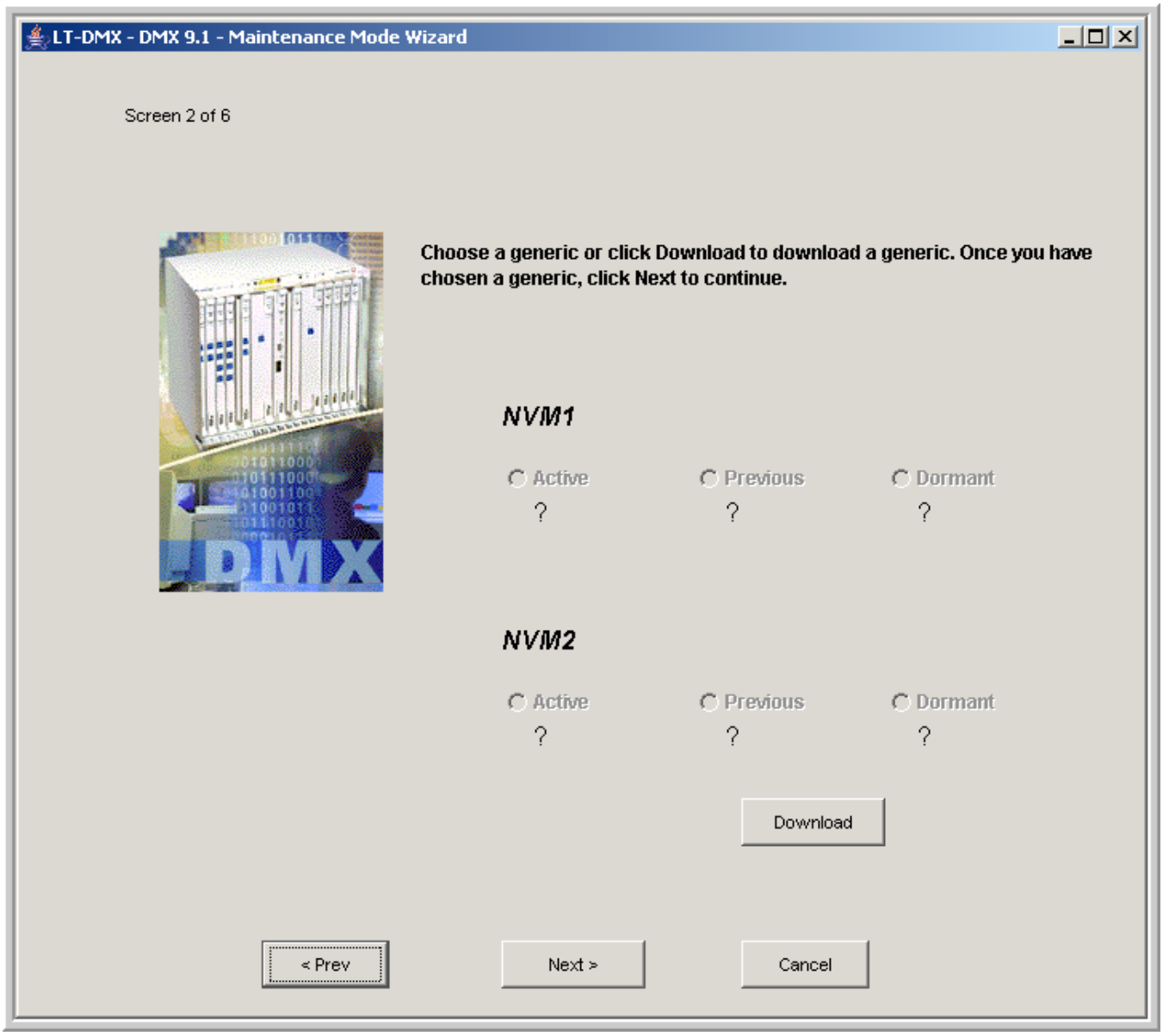
You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

9 **Important!** The actual time and date are preset from your PC.

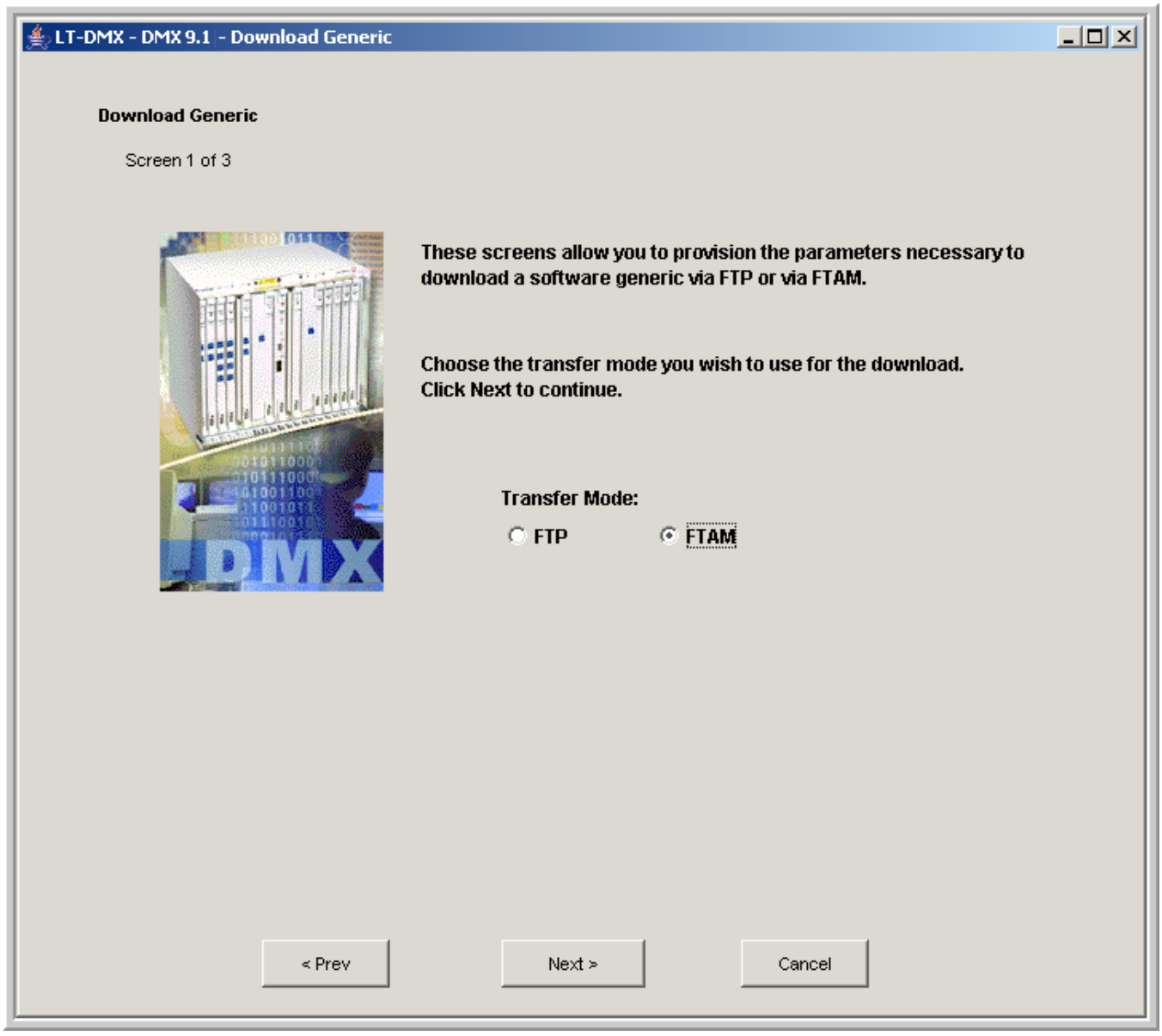
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



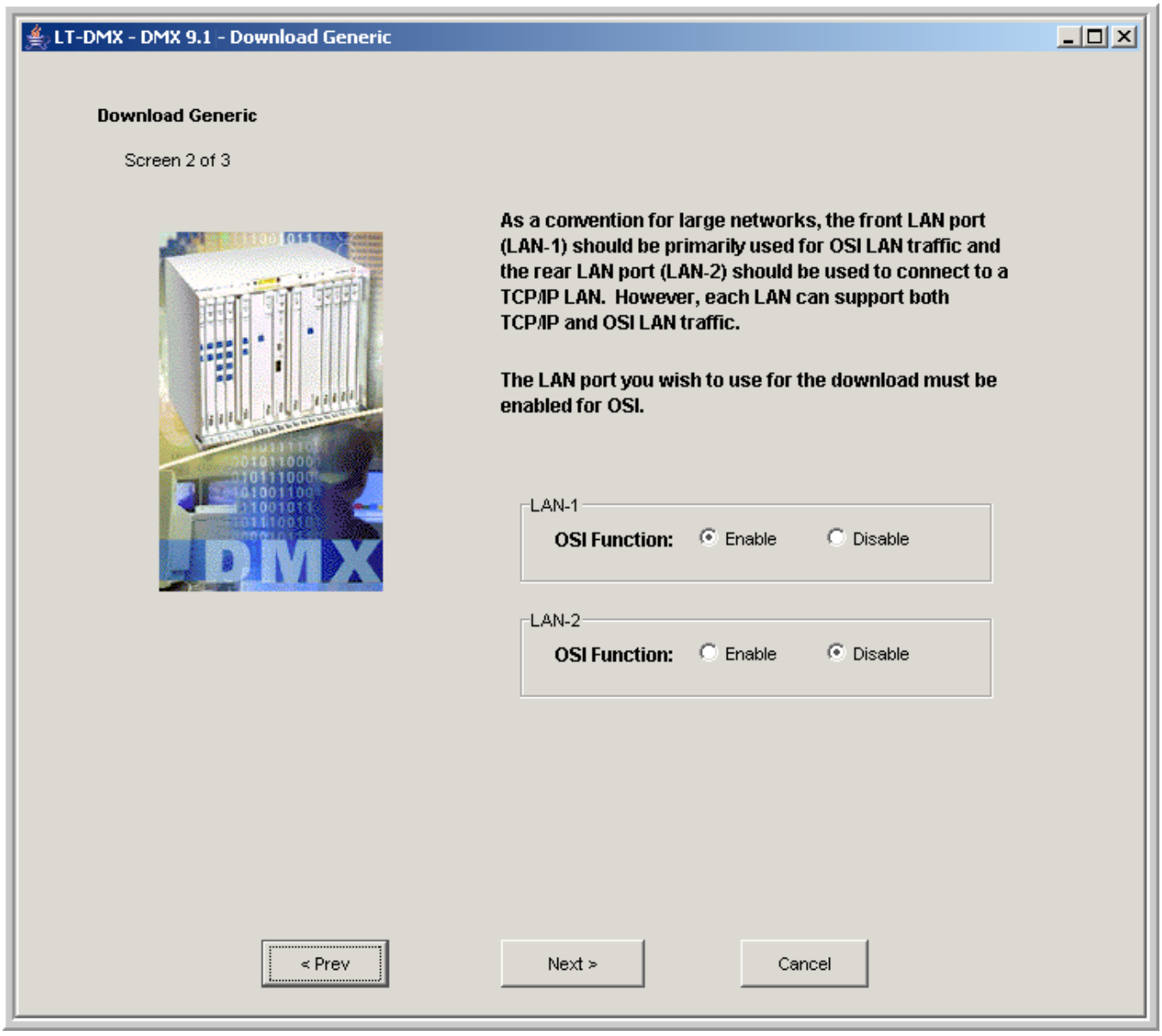
10 On Screen 2 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Generic Wizard appears.



11 On Screen 1 of 3 in the Download Generic Wizard, read the information, select **FTAM** and click **Next**.

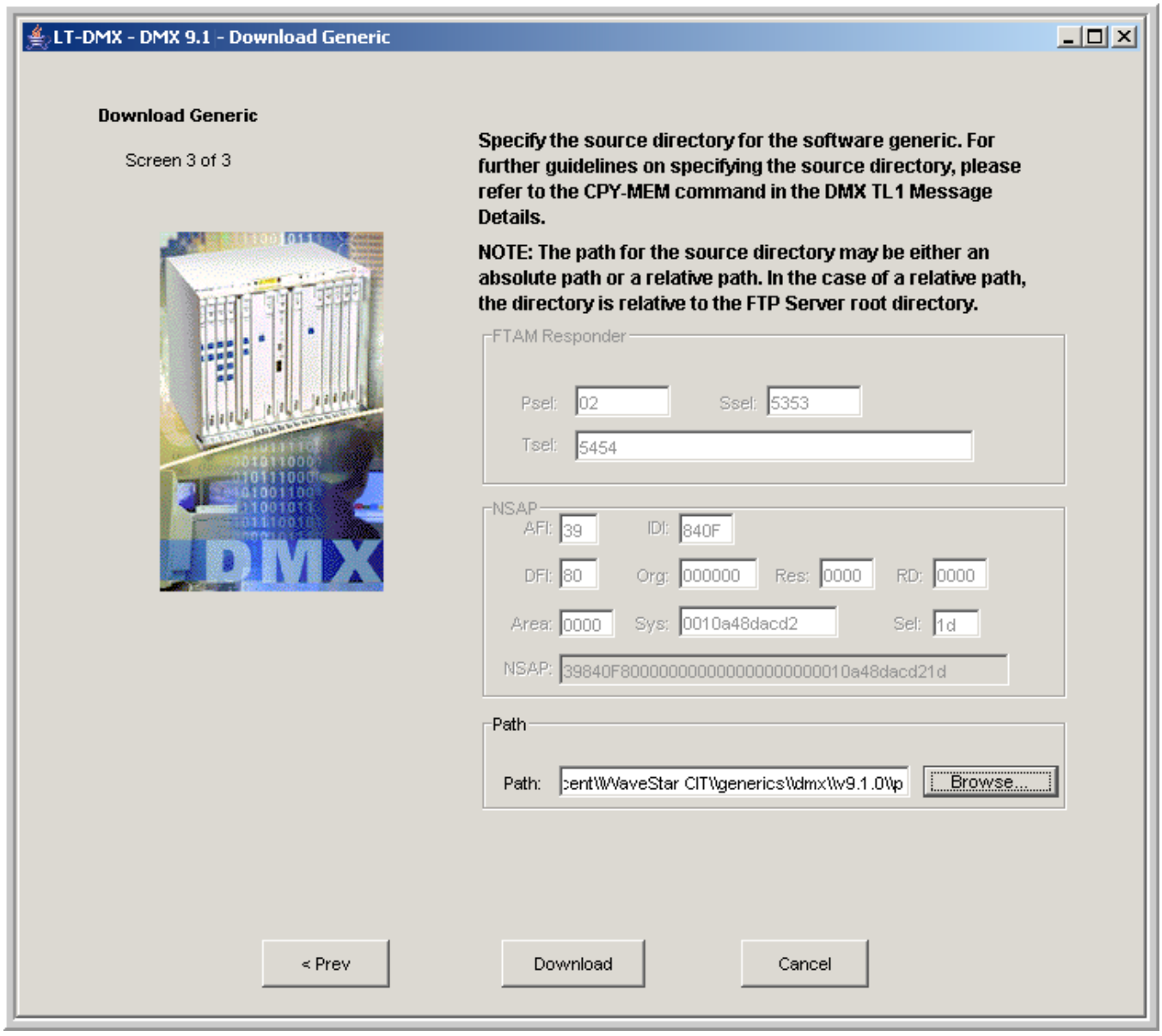
Result: Screen 2 of 3 in the Download Generic Wizard appears.



12 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

On Screen 2 of 3 in the Download Generic Wizard, read the information, verify that the LAN port you are connected to has OSI Function Enable selected, and click **Next**.

Result: Screen 3 of 3 in the Download Generic Wizard appears.



13 On Screen 3 of 3 in the Download Generic Wizard in the **Path** panel, enter the current location of the generic to be downloaded in the Path field or use the **Browse** button to select the generic to be downloaded. Click **Download**.

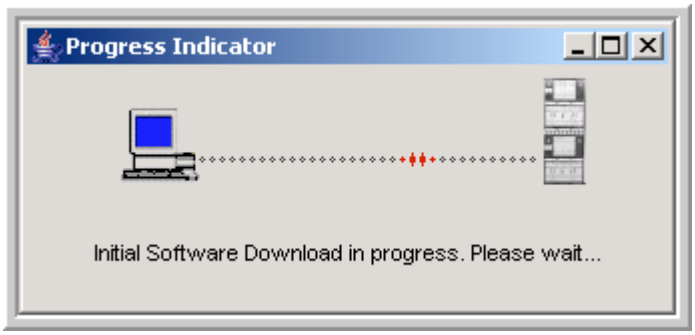
The value of the Path field can be either an absolute path or a relative path that is relative to the root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**. The syntax of the relative path must start

with the path name; for example: **\generics\DMX\9.1.0\p**. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

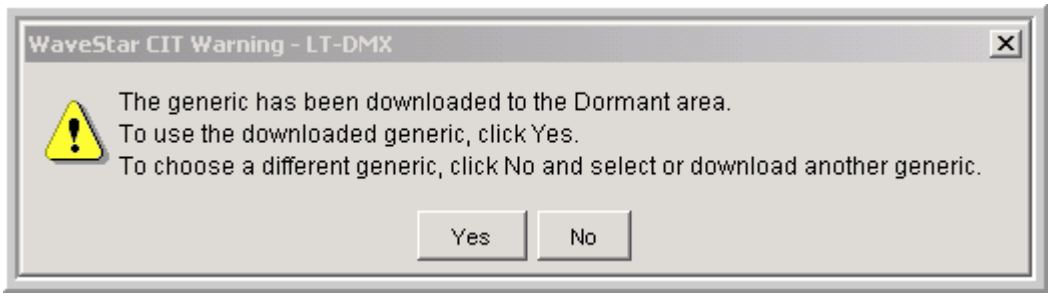
Result: A warning message appears listing the options you provisioned in the previous screens.

14 Verify the information and either click **Yes** to start the download process or click **No** to return to the download screen and change your selections.

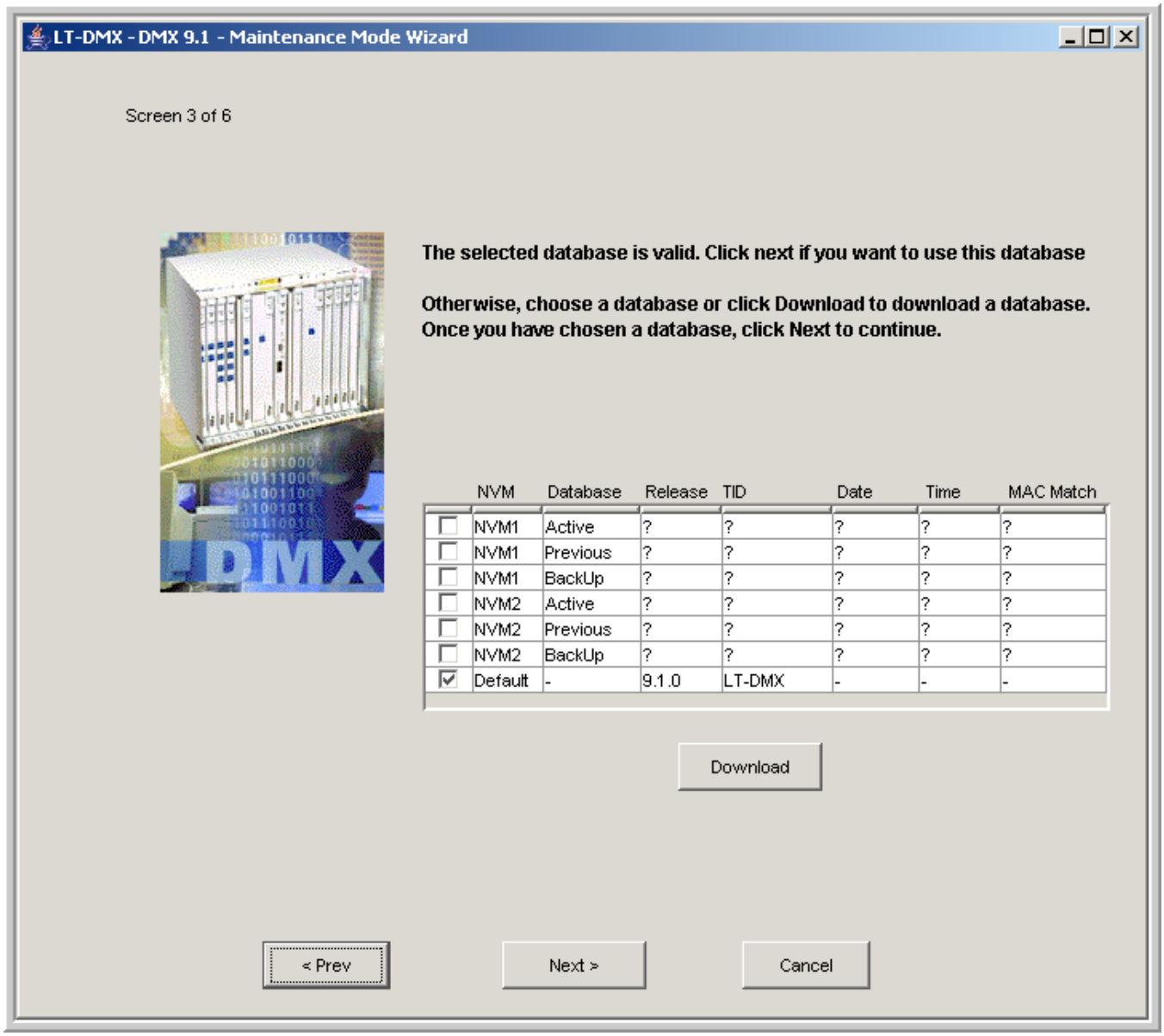
Result: If you choose yes, the following initial software download progress indicator runs for approximately 30 minutes.



15 Once the software generic download is complete, the following confirmation message appears. Click **Yes** to use the generic that is now in the Dormant area.

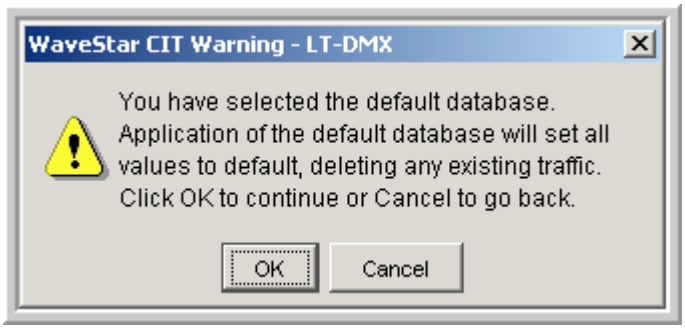


Result: Screen 3 of 6 in the Maintenance Mode Wizard appears. Depending on the boot code of your SYSCTL (refer to Step 3), your default database is either 6.0.x, 7.0.x, 7.1.x, 8.0.x, or 9.0.x.

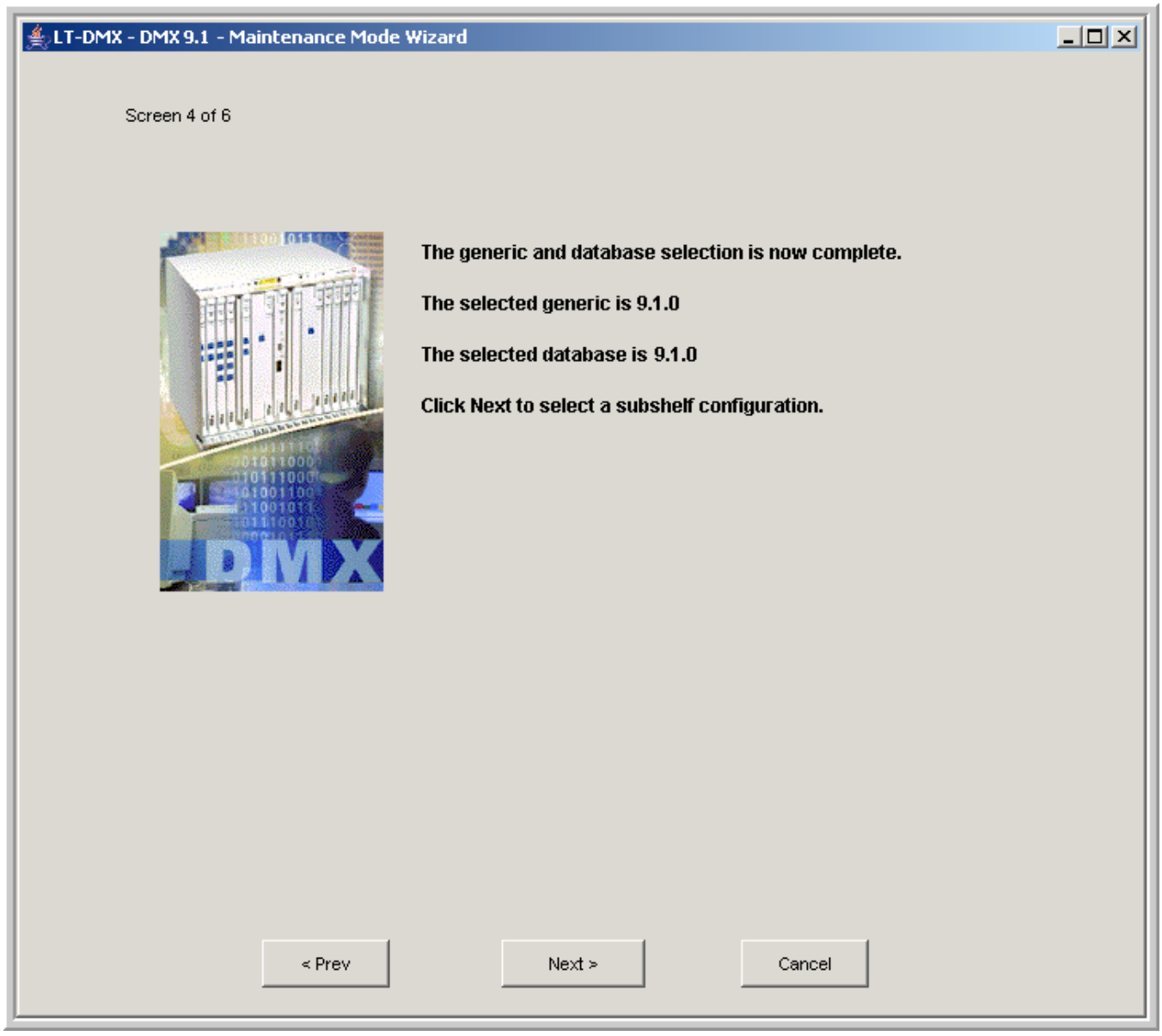


16 On Screen 3 of 6 in the Maintenance Mode Wizard, click the check box next to *Default* to create a default database and click **Next**.

Result: When you select the default database, the following confirmation message appears. Since this is an initial installation, click **OK** to use default database.

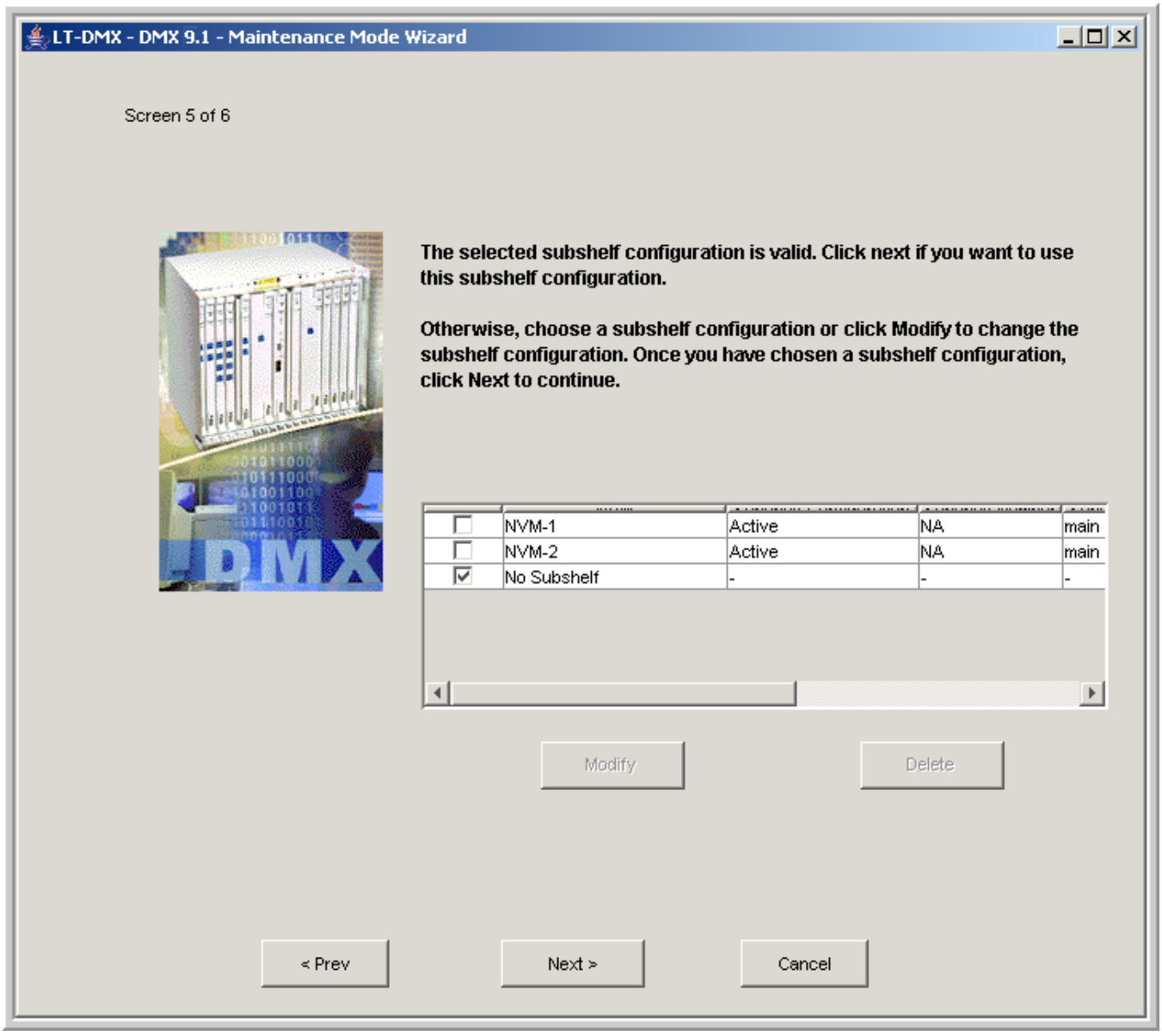


Result: Screen 4 of 6 in the Maintenance Mode Wizard appears.



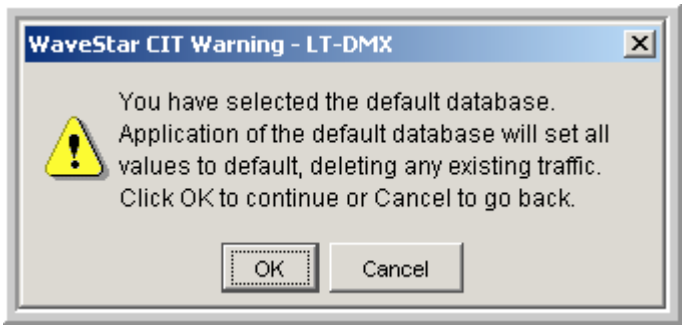
17 On Screen 4 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct 9.1.x generic and the default database, and click **Next** .

Result: Screen 5 of 6 in the Maintenance Mode Wizard appears.

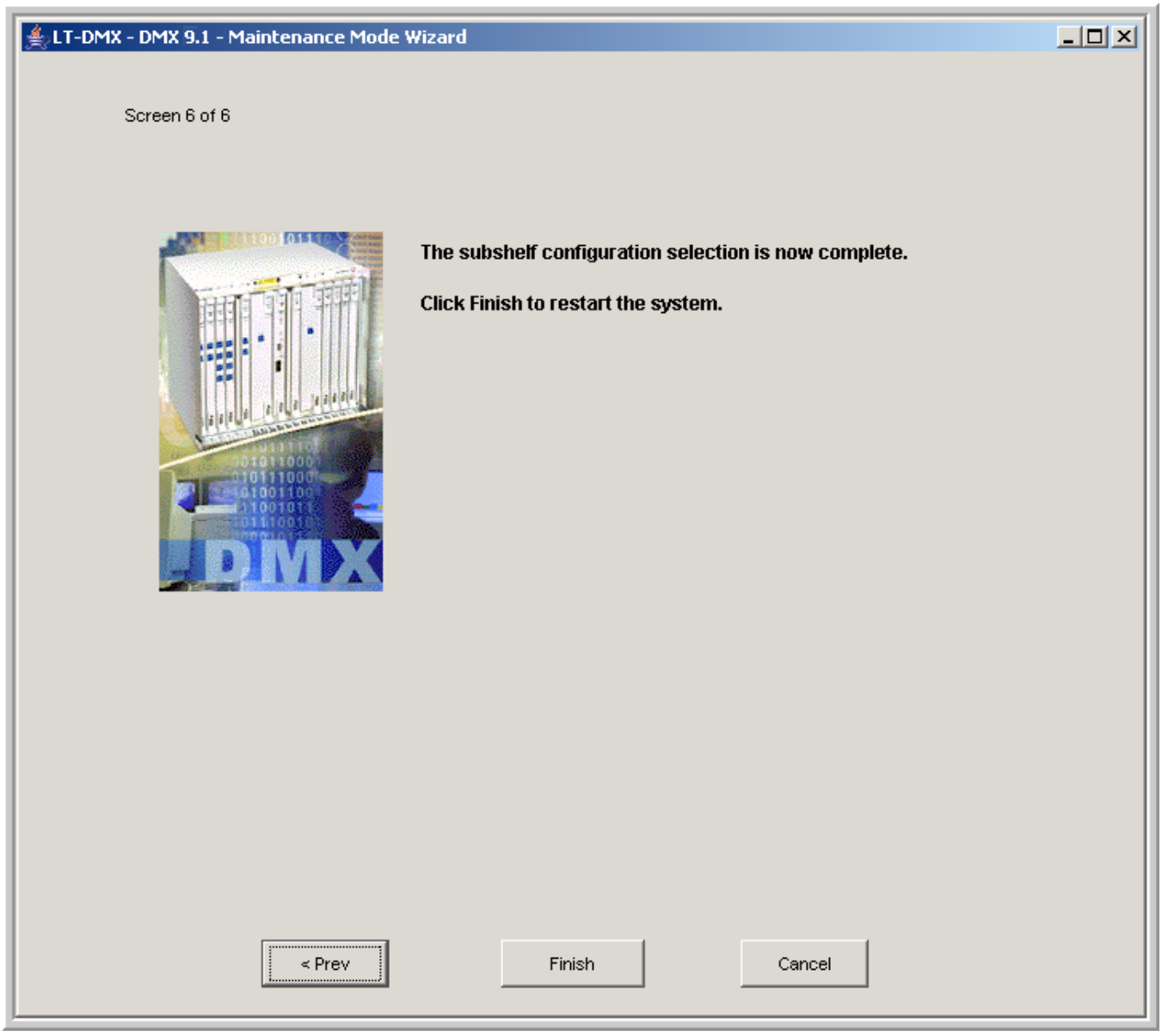


18 On Screen 5 of 6 in the Maintenance Mode Wizard, select *No Subshelf* or select NVM 1 or 2 if this shelf will be a subshelf click **Next** .

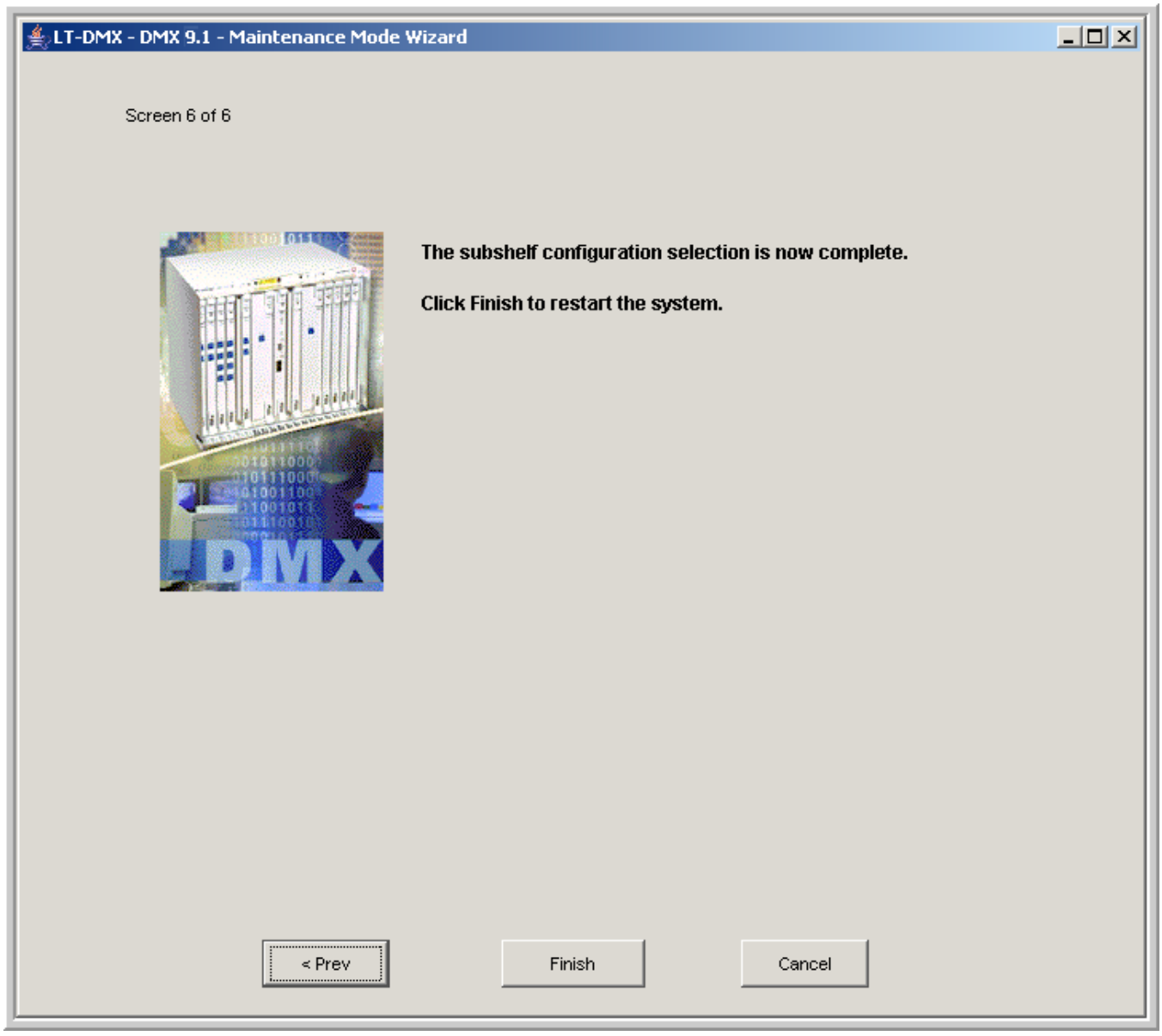
Result: The following confirmation message appears again. Since this is an initial installation, click **OK** to use default database.



Result: Screen 6 of 6 in the Maintenance Mode Wizard appears.



Result: Screen 6 of 6 in the Maintenance Mode Wizard appears.



19 On Screen 6 of 6 in the Maintenance Mode Wizard, click **Finish** to restart the system and apply the generic and default database.

Result: The Maintenance Mode Wizard closes and your connection to the shelf is terminated.

The LNW2 SYSCTL exhibits the following visible cycles while the generic and database are installed and validated and the SYSCTL reboots:

1. For approximately 20 minutes, the alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9 depending on your Maintenance Mode) and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
2. After approximately 20 minutes, all LEDs extinguish and the **IND** display on the SYSCTL is blank for approximately 5 seconds.
3. A flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and the **IND** display is blank for approximately 20 seconds.
4. The **ACTIVE** LED lights and remains lighted.
5. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. After approximately 30 seconds, the **CR** LED flashes 10 times and then extinguishes, and the **b** continues flashing for approximately another 30 seconds.

20 What was the available default database on Screen 3 of 6 in the Maintenance Mode Wizard in Step 15?

If...	Then...
7.0.x 7.1.x 8.0.x 9.0.x	You have a valid database. The SYSCTL continues to exhibit the following visible indicators: • The **IND** display is blank. • The **ABN** and **NE** LEDs light and remain lighted for approximately 6 minutes. The active generic and database are validated and copied to the second NVM. • When the **ABN** and **NE** LEDs extinguish and only the **ACTIVE** LED is lighted, and nothing appears in the **IND** display, the NE software and database installation is complete. • Proceed to Step 29.

If...	Then...
6.0.x	You now have an invalid database because the default database does not match the 9.1.x that is now active on NVM1. The SYSCTL continues to exhibit the following visible indicators: • The alternating **M** and **P** and **9** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0** appear in the **IND** display on the SYSCTL. • The **MN**, **ABN**, and **NE** LEDs light and remain lighted. The **MN** LED indicates that the database is invalid. • Continue with Step 21 to repeat the Maintenance Mode Wizard and select the default 9.1.x database that is now available.

21 If necessary, close the Maintenance Mode Wizard. From the Screen 6 of 6 in the Maintenance Mode Wizard, click **Cancel** and click **Yes** in the confirmation window.

Result: The *Maintenance Mode Wizard* closes.

22 In the Network View, right-click the LT-DMX NE icon and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

23 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

24 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

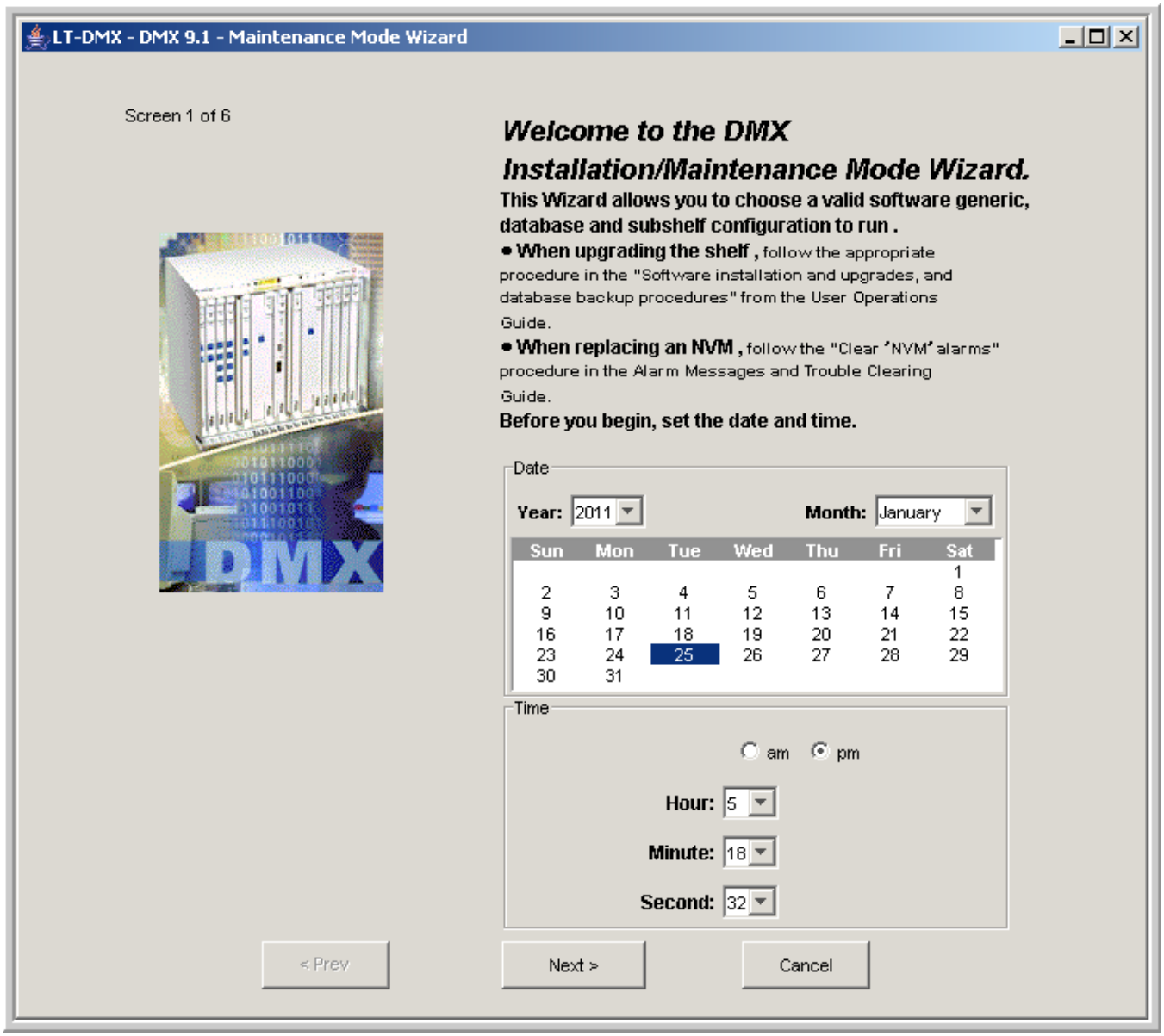
User ID: ***LUC01***

Password: ***DMX2.5G10G***

Click **OK**.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

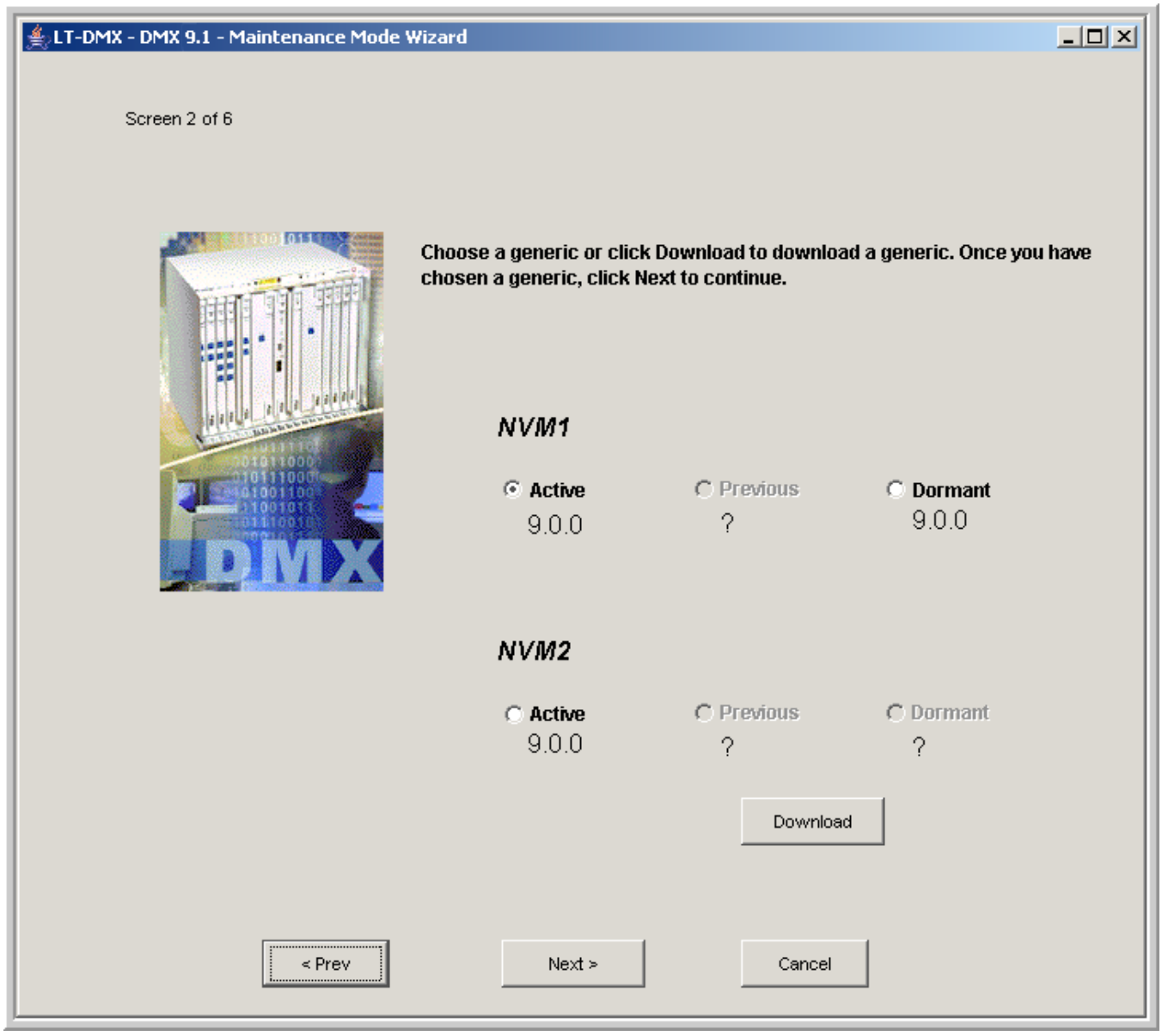
The title bar of the Maintenance Mode Wizard displays DMX 9.0.



25 **Important!** The actual time and date are preset from your PC.

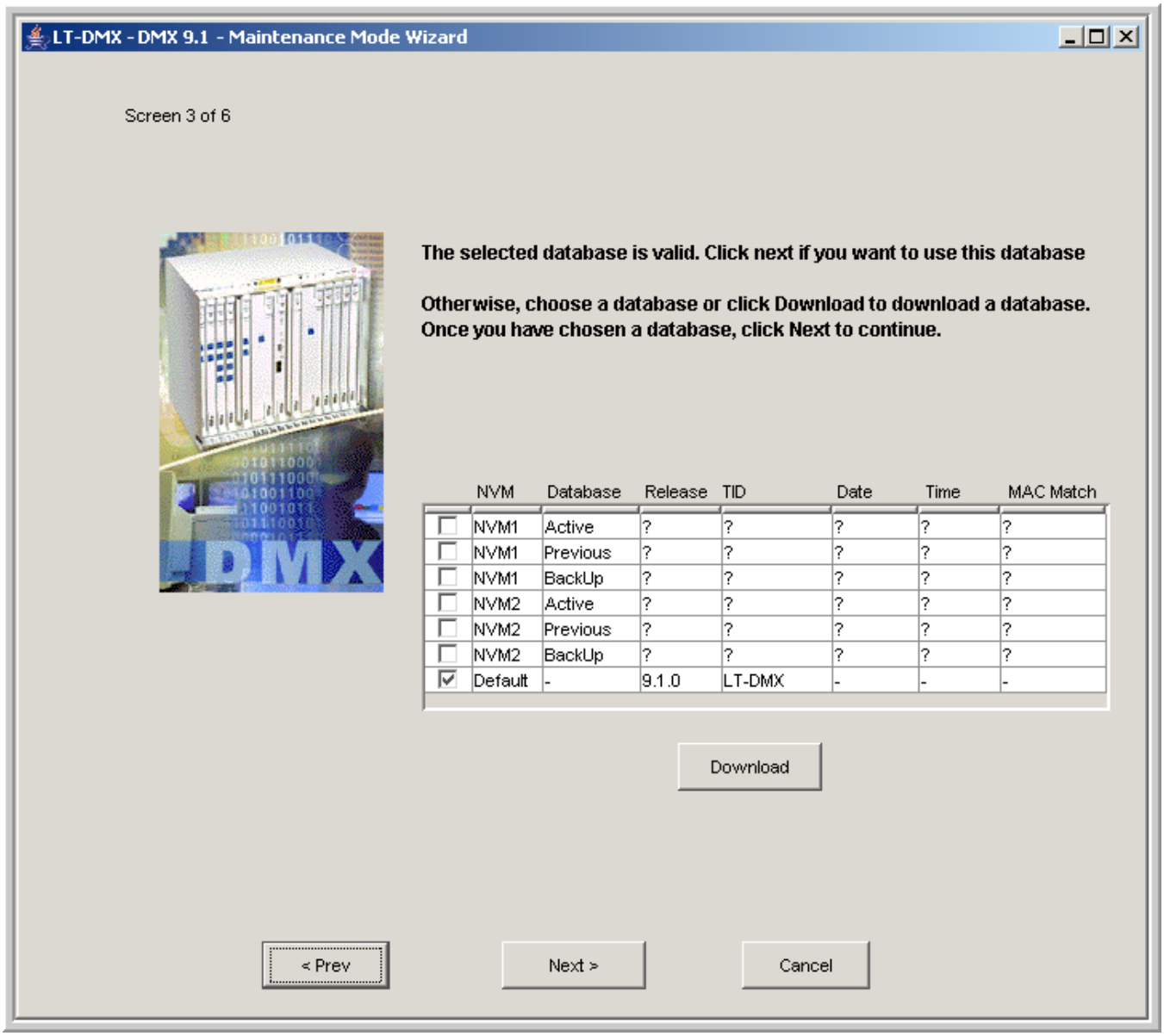
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



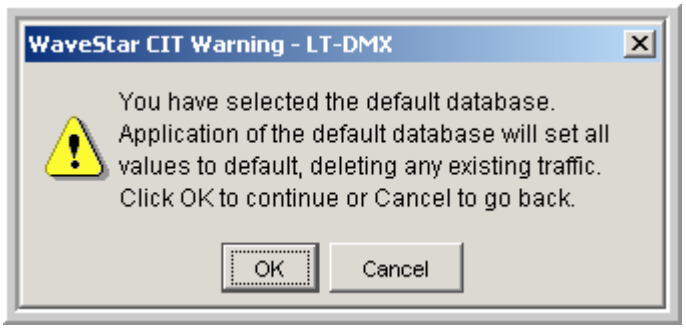
26 On Screen 2 of 6 in the Maintenance Mode Wizard, select **Active** on NVM1, and click **Next**.

Result: Screen 3 of 6 in the Maintenance Mode Wizard appears. Your default database is 9.0.x.

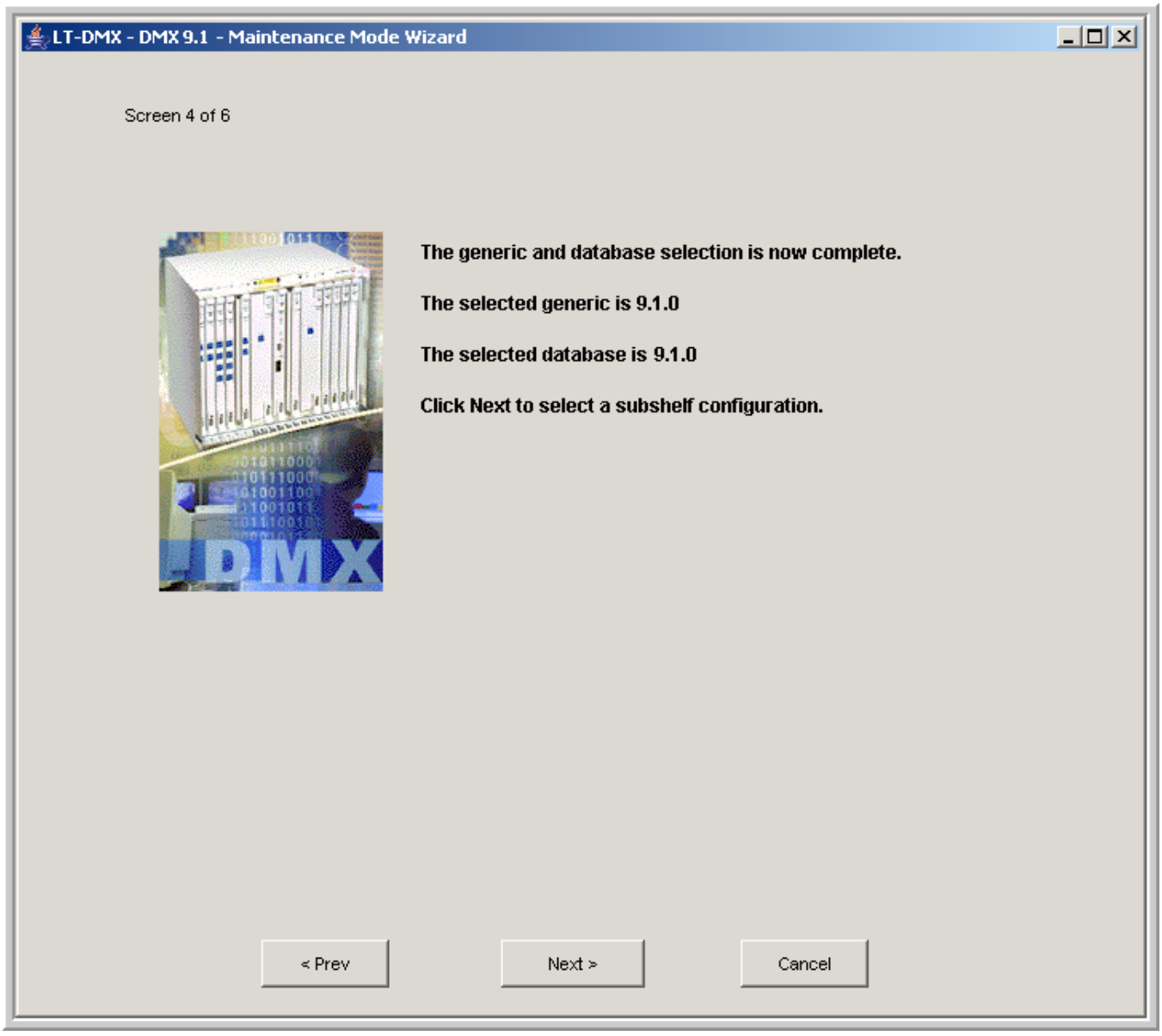


27 On Screen 3 of 6 in the Maintenance Mode Wizard, click the check box next to *Default* to create a default 9.1.x database and click **Next**.

Result: When you select the default database, the following confirmation message appears. Since this is an initial installation, click **OK** to use default database.



Result: Screen 4 of 6 in the Maintenance Mode Wizard appears.



28 Repeat the procedure from Step 17.

29 To verify that the download was successful, depress and hold the **ACO TEST** push-button on the LNW2 SYSCTL for about 4 seconds.

Result: All LEDs on the shelf light. A red, 35-segment (5 x 7) rectangle appears in the **IND** display on the SYSCTL. Since the **IND** display is a 35-segment display, this test indicates all segments are working.

30 Release the **ACO TEST** push-button on the LNW2 SYSCTL when the red rectangle disappears in the **IND** display.

Result: The current software generic appears in the **IND** display on the LNW2 SYSCTL and the shelf LEDs return to their previous status.

31 From the Network View of the *WaveStar*® CIT session you established in Step 4, select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

32 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

33 In the Network View, right-click the LT-DMX NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

34 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

35 Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

Password: ***DMX2.5G10G***

Click **OK**.

Important! LUC01, LUC02, and LUC03 are the default privileged User IDs, and DMX2.5G10G is the default privileged password for Alcatel-Lucent 1665 DMX. To preserve the security of your equipment, it is highly recommended that you change all three logins and passwords during your first session after completing this initial installation procedure.

Result: The title bar of the System View and the legal notice text both reflect the current NE software generic, for example: 9.1.0.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

36 Is the Generic Software Version correct?

If...	Then...
Yes	STOP! End of Procedure.
No	Contact your next level of support.

END OF STEPS

Procedure 2-2: Install software generic (initial) via FTP

Overview

Use this procedure to install software generic in a factory-fresh LNW2 SYSCTL via File Transfer Protocol (FTP). A factory-fresh SYSCTL circuit pack does not contain a software generic; it only contains the information loaded at the factory (boot code).

To install the software generic via FTAM, refer to Procedure 2-1: “Install software generic (initial) via FTAM” (p. 2-3).

Important! You must have direct TCP/IP connectivity to your NE via LAN-1 or LAN-2 and you must know the IP address of your FTP server. (The *WaveStar*® CIT can be the FTP server.)

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to “Required equipment” (p. 2-2) listed in this chapter, the following equipment is also required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port (required for TCP/IP connectivity)
- Copy of the new system generic software program on your PC or FTP server
- Factory-fresh LNW2, system controller (SYSCTL), with two factory-installed non-volatile memory (NVM) cards installed
- Current *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed

Before you begin

Before performing this procedure:

1. Refer to “Before you begin” (p. 2-2) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.
2. Verify that new software generic program is available.
3. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for a description of any special considerations required when installing this version of software.
4. Unseat all circuit packs in the shelf, except the SYSCTL to which you are downloading the new software generic.
5. If the *WaveStar*® CIT is the FTP server, determine the IP address assigned to your PC LAN card that is used to connect to the shelf.

Important! This procedure is intended for new shelf installations only. Do not use this procedure to upgrade an in-service shelf.

Steps

Complete the following steps to install the software generic program via FTP in a new shelf installation with only a factory-fresh SYSCTL installed.

1 **Important!** A factory-fresh SYSCTL circuit pack does not contain a software generic; it only contains the information loaded at the factory (boot code).

Verify that only a factory-fresh LNW2 SYSCTL is installed in your Alcatel-Lucent 1665 DMX shelf; ensure that no other circuit packs are seated in the shelf. An LNW2 SYSCTL is required to install 9.1.x software; you cannot install 9.1.x into an LNW1 SYSCTL.

2 **Important!** For software installation, ensure that two NVMs are present in the LNW2 SYSCTL.

After the LNW2 is installed, if one or both NVMs are missing, `NVM removed` alarm(s) are issued and:

- If one NVM socket is empty or an NVM is failed, the **IND** displays an alternating **N** and **O** and **x** (x=1 or 2, indicating the offending NVM socket).
- If both NVM sockets are empty, the **IND** displays an alternating **E** and **0** and **1**.

Refer to Step 3 for the complete listing of codes and required actions.

Insert the LNW2 (SYSCTL) circuit pack into the slot labeled **CTL** in the center of the shelf using a steady pressure on both faceplate latches. Allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 10 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and the **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.
4. Continue with Step 3.

3 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
alternating **M** and **P** and **6** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **7** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **7** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **1**	7.1 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **8** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Continue with Step 4.
alternating **M** and **P** and **9** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Continue with Step 4.
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent-supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.

If...	Then...
alternating **E** and **1** and **0**	LNW2 SYSCTL does not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.
alternating **N** and **O** and **x**	"x" indicates that the NVM socket (1 or 2) is empty or the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
Letter **U**	LNW2 SYSCTL does not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

4 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

Double-click the *WaveStar*® CIT icon on your desktop and login (if necessary), to start the *WaveStar*® CIT software on the PC. Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

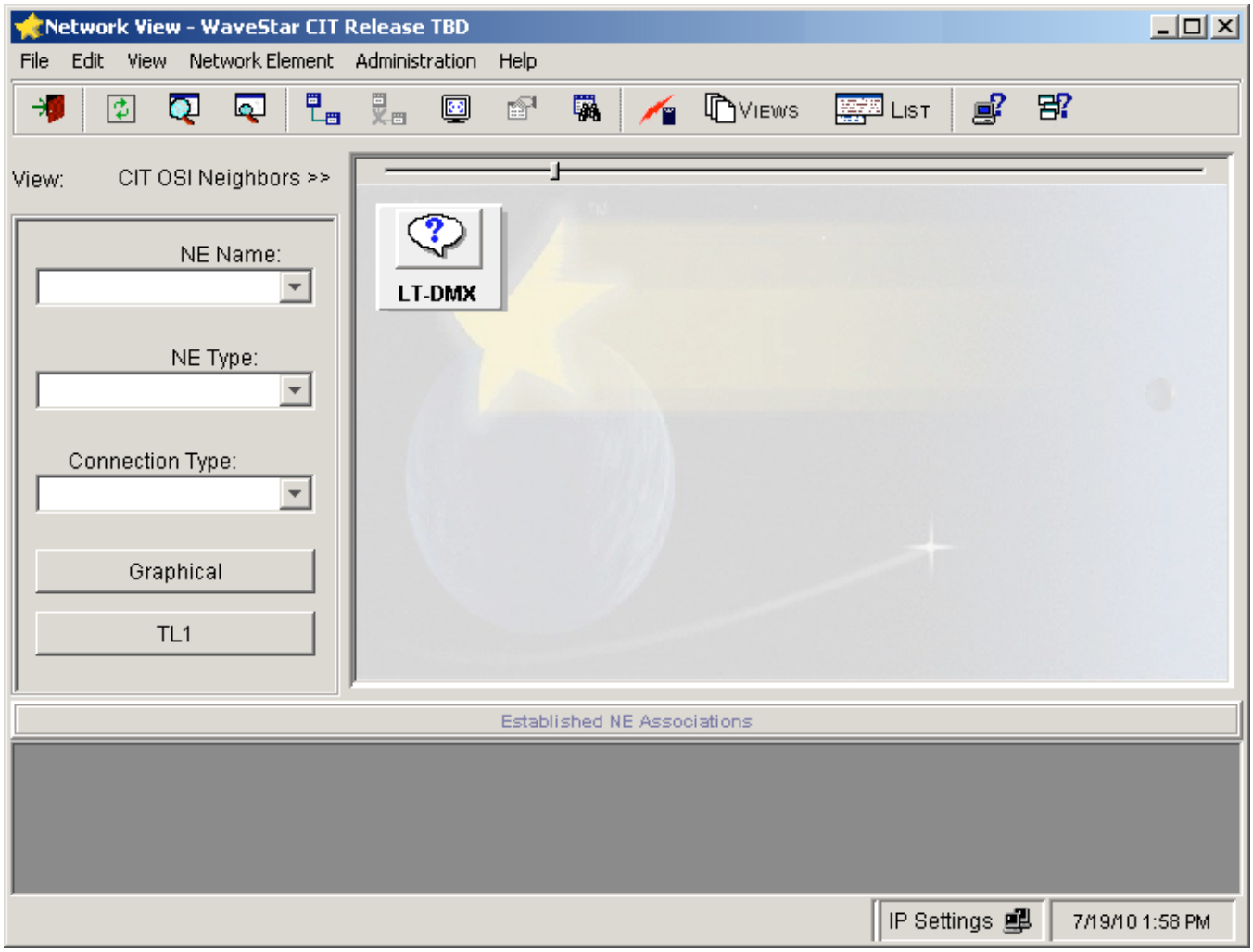
Result: The *Network View* appears.

5 From the **View:** pull-down menu, select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI Neighbor(s) are automatically detected.

If you were previously logged in to the NE and/or you do not see your NE, from the Network View, select **View** → **Refresh OSI View**.



6 In the Network View, right-click the LT-DMX NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

7 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

8 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

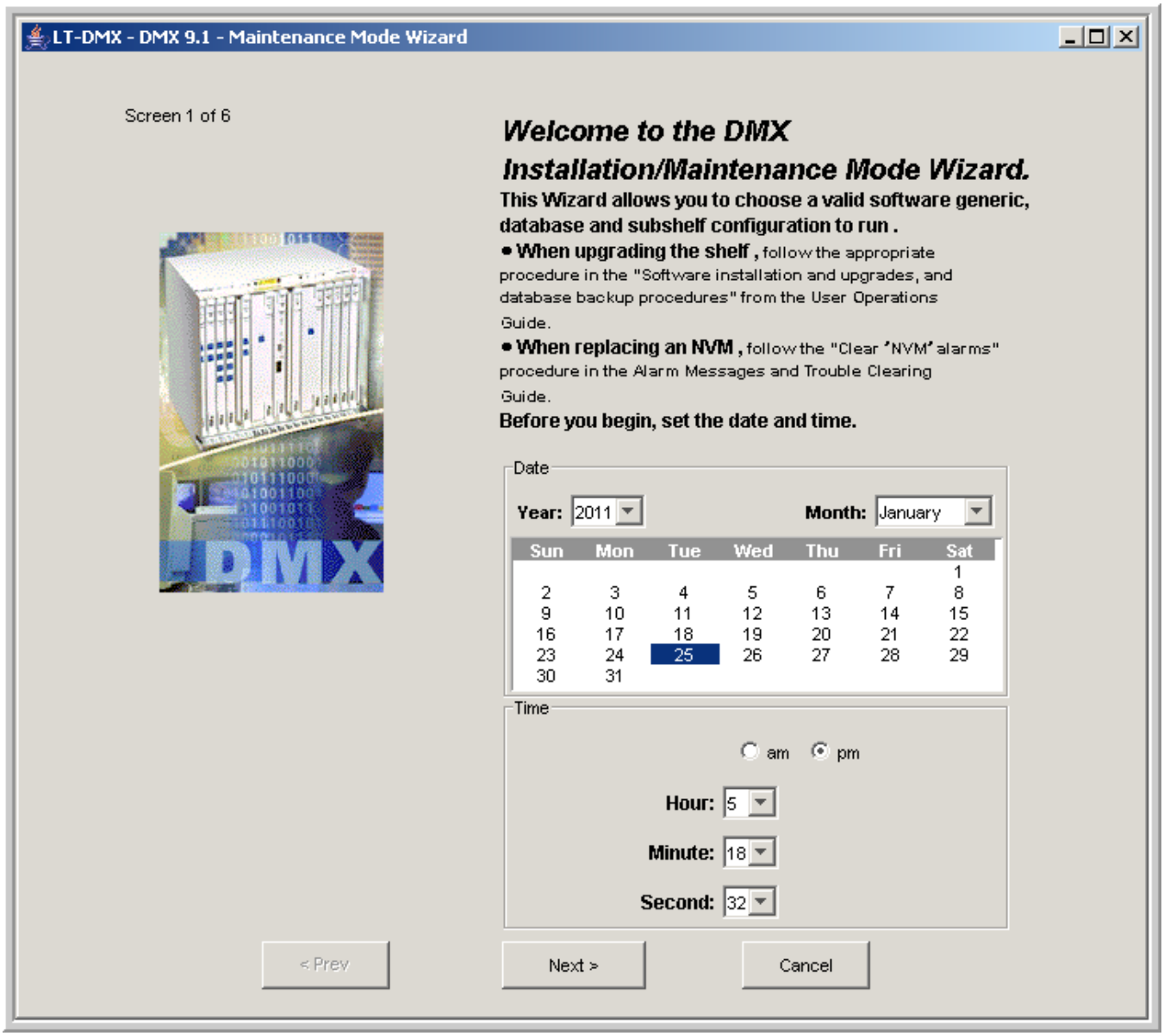
Password: ***DMX2.5G10G***

Click **OK**.

Important! LUC01, LUC02, and LUC03 are the default privileged User IDs, and DMX2.5G10G is the default privileged password for Alcatel-Lucent 1665 DMX. To preserve the security of your equipment, it is highly recommended that you change all three logins and passwords during your first session after completing this initial installation procedure.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 3), the title bar of the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0. DMX 9.0, or DMX 9.1.



This screen picks up the time format preference from the *WaveStar*® CIT.

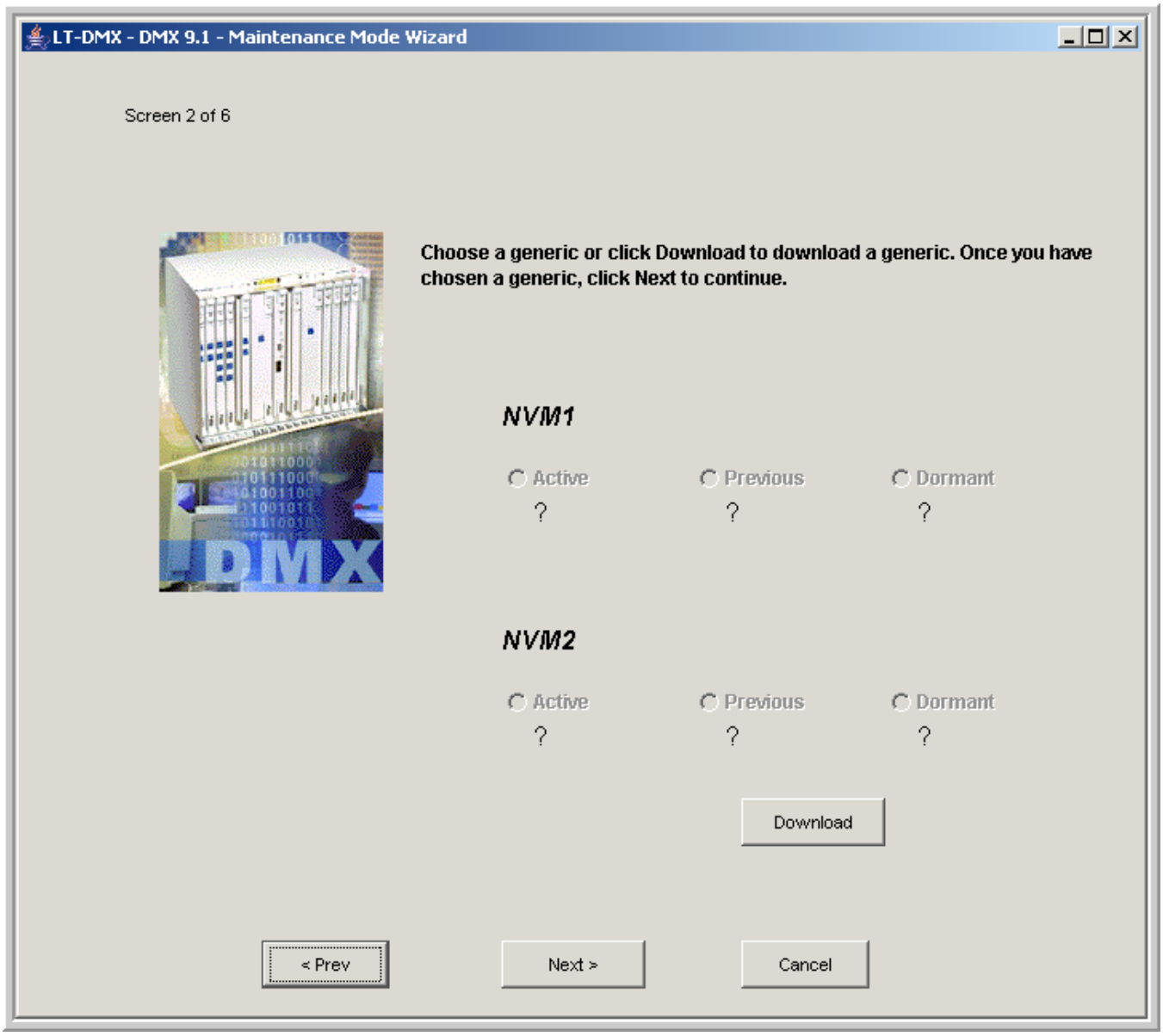
You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

9 **Important!** The actual time and date are preset from your PC.

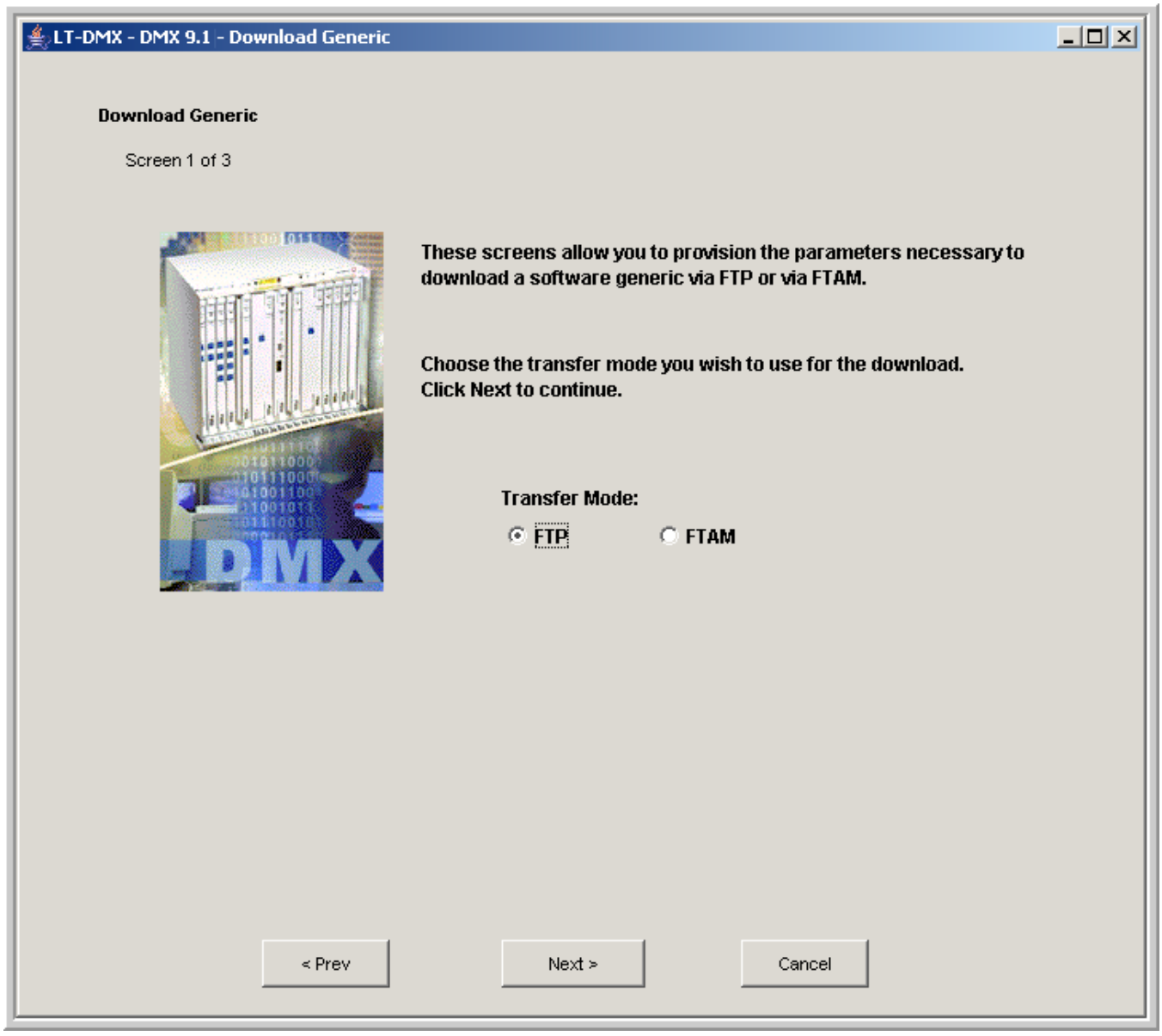
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



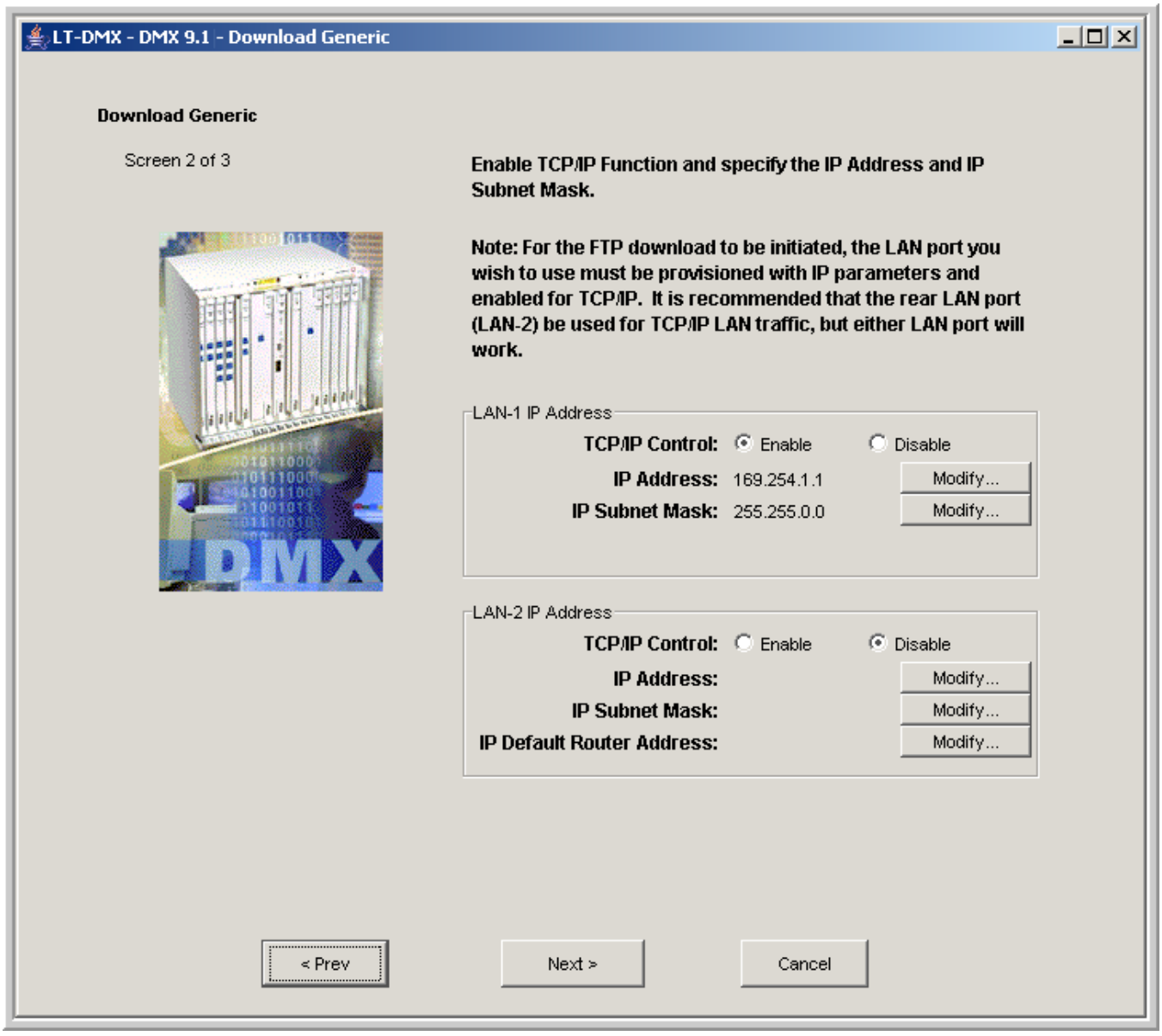
10 On Screen 2 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Generic Wizard appears.



11 On Screen 1 of 3 in the Download Generic Wizard, read the information, select **FTP** and click **Next**.

Result: Screen 2 of 3 in the Download Generic Wizard appears.



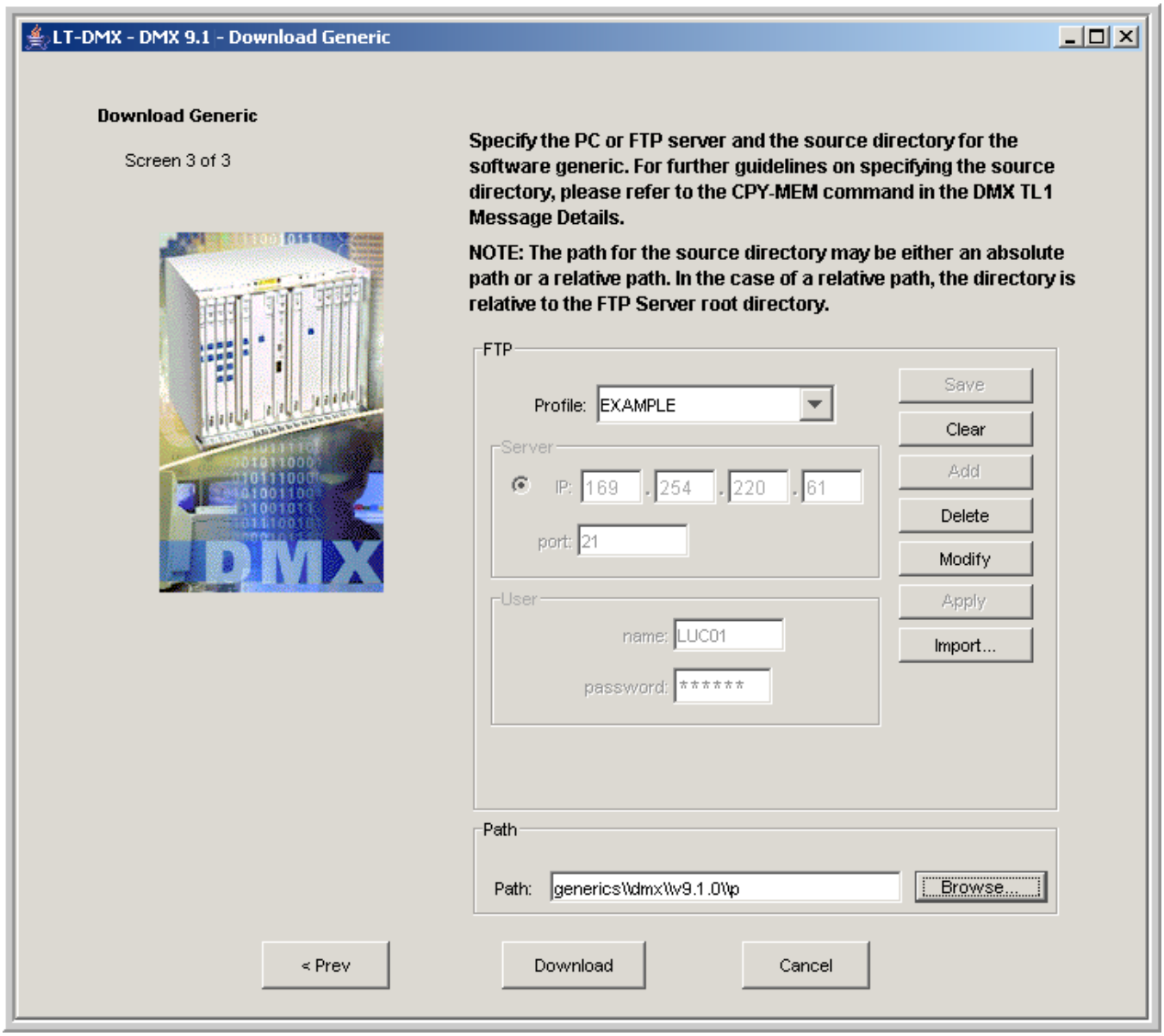
12 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

If the boot code of your LNW2 (Step 3) was 7.1 or later, you may see the IP Address and IP Subnet Mask field populated with the defaults illustrated in Screen 2 of 3.

Important! If the default IP address and subnet mask are present, you must complete the initial software installation before you can change these values.

If required, follow the instructions to enable TCP/IP Control on the LAN port to which you are connected. Click **Modify** to enter the IP Address, IP Subnet Mask, and/or IP Default Router Address. If you are connecting directly to the shelf without a router, the IP address of the FTP server must be in the same subnet as the LAN port. Click **Next**.

Result: Screen 3 of 3 in the Download Generic Wizard appears.



13 Select the connection from the **Profile** pull-down menu and proceed to Step 15. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the download to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

14 If you entered connection information in Step 13 and wish to keep the information for future FTP activities:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Important! Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

15 On Screen 3 of 3 in the Download Generic Wizard in the **Path** panel, enter the current location of the generic to be downloaded in the Path field or use the **Browse** button to select the generic to be downloaded. (If the FTP server is not the local host, the **Browse** button is greyed out.) Click **Download**.

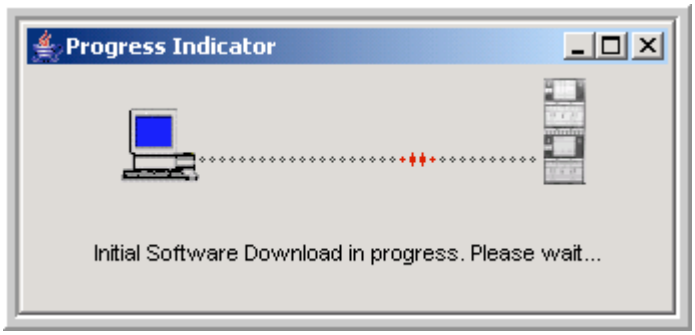
The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**. The syntax of the relative path must start with the path name; for example: **`\generics\DMX\9.1.0\p`**. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

If the FTP server is not the *WaveStar*® CIT, then enter the path starting at the FTP home directory on the server.

Result: A warning message appears listing the options you provisioned in the previous screens.

16 Verify the information and either click **Yes** to start the download process or click **No** to return to the download screen and change your selections.

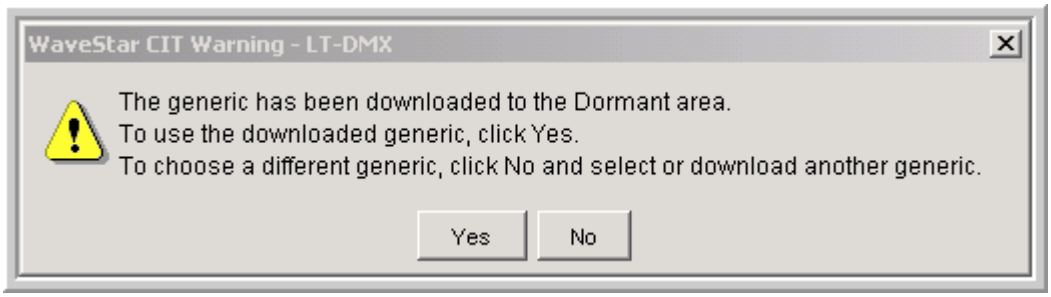
Result: If you choose yes, the following initial software download progress indicator runs for approximately 30 minutes.



17 Do you wish to observe the FTP download progress?

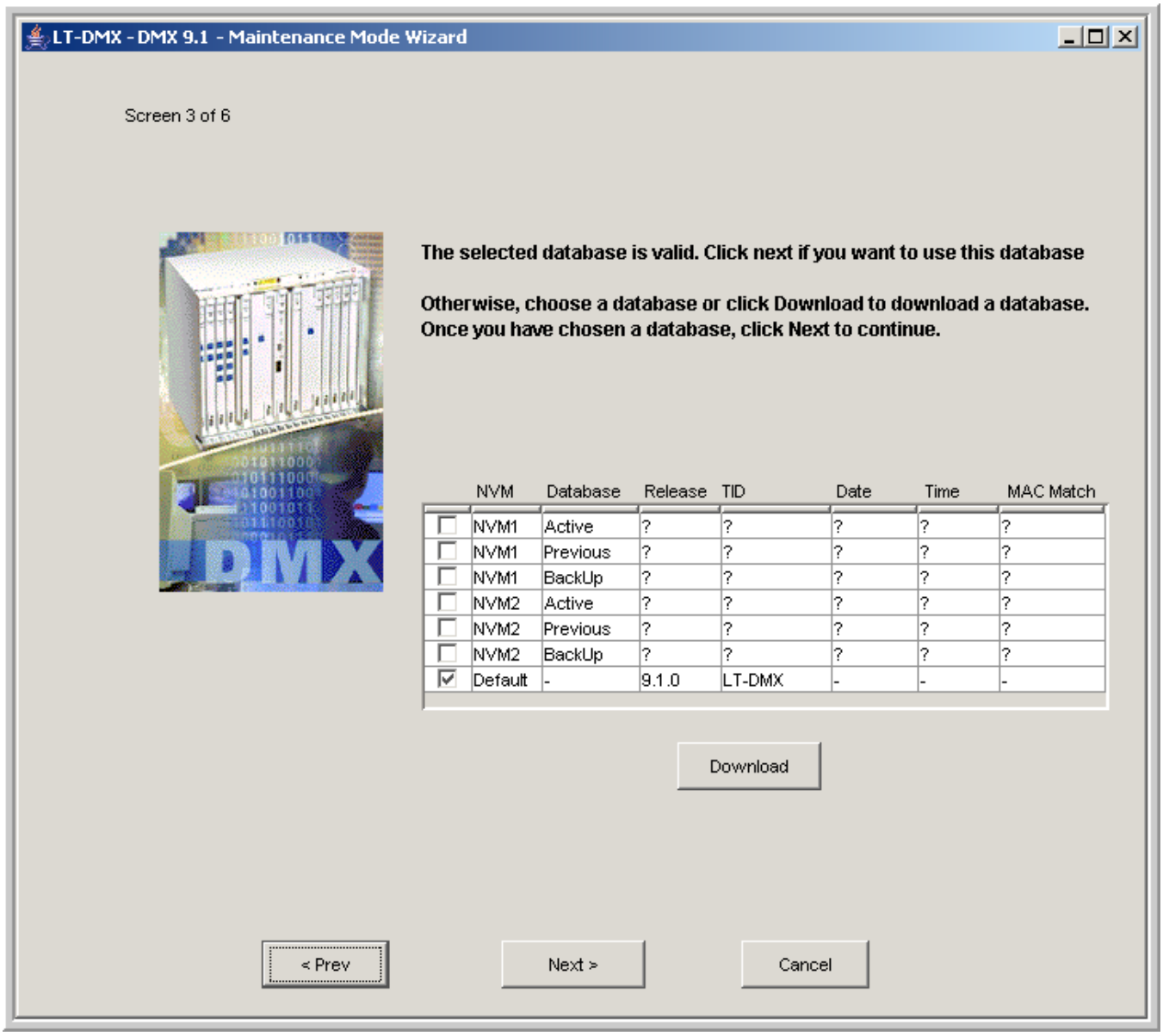
If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 18.
No	Continue with Step 18.

18 Once the software generic download is complete, the following confirmation message appears. Click **Yes** to use the generic that is now in the Dormant area.



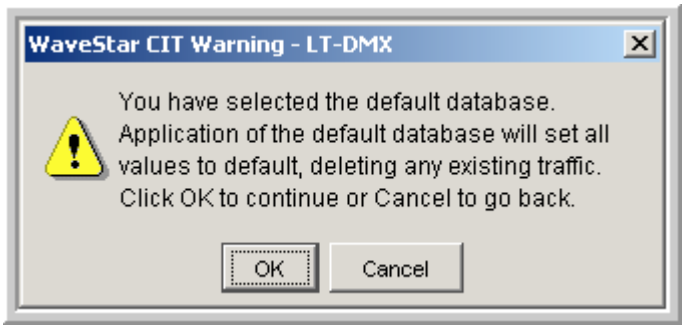
Result: Screen 3 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 3), the title bar of the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0, DMX 9.0, or DMX 9.1.

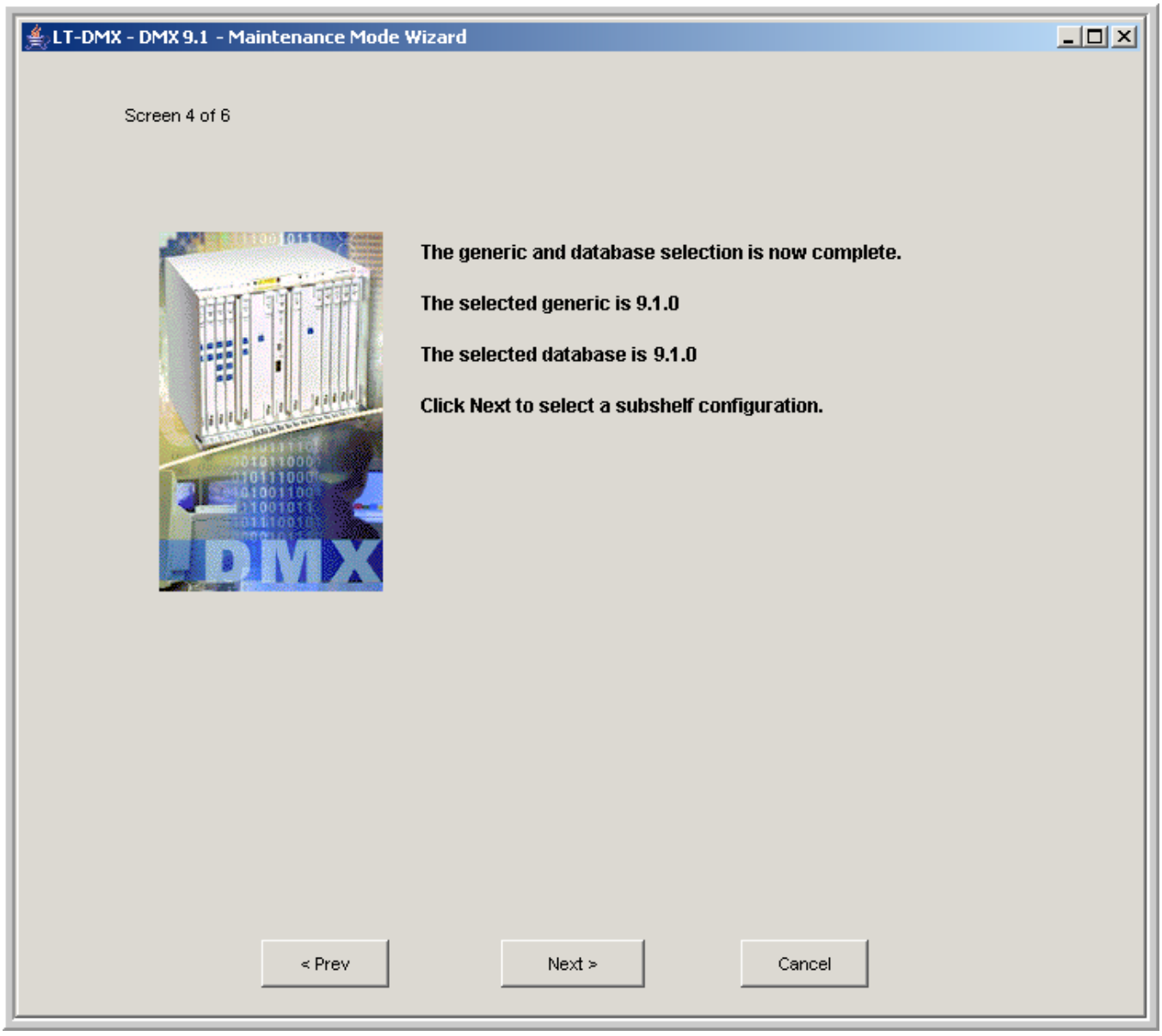


19 On Screen 3 of 6 in the Maintenance Mode Wizard, click the check box next to *Default* to create a default database and click **Next**.

Result: When you select the default database, the following confirmation message appears. Since this is an initial installation, click **OK** to use default database.

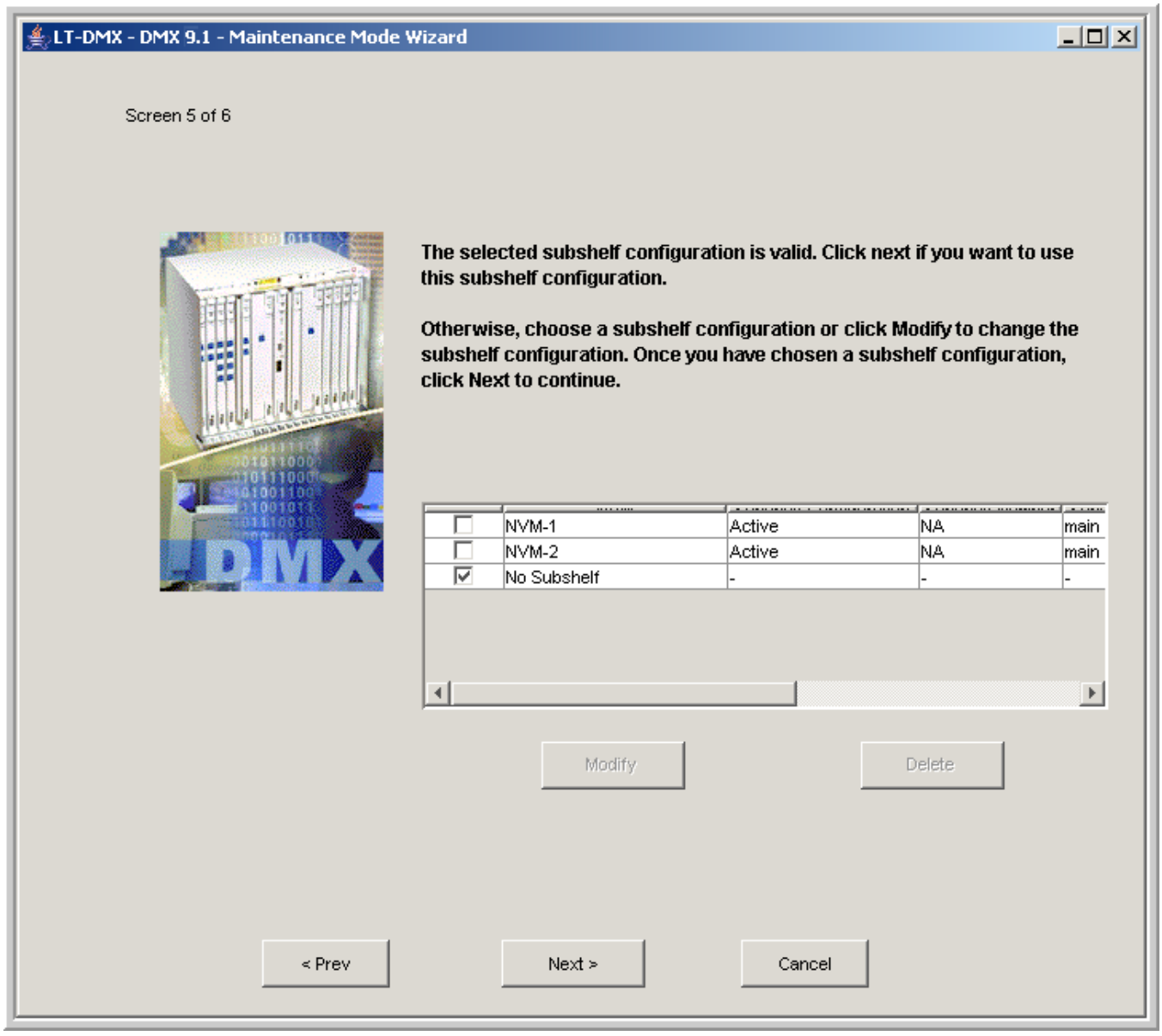


Result: Screen 4 of 6 in the Maintenance Mode Wizard appears.



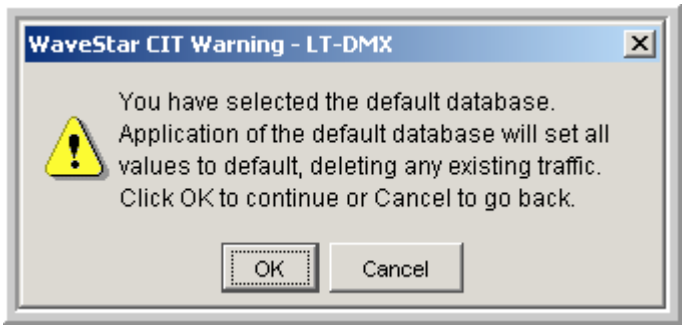
20 On Screen 4 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct 9.1.x generic and the default database, and click **Next** .

Result: Screen 5 of 6 in the Maintenance Mode Wizard appears.



21 On Screen 5 of 6 in the Maintenance Mode Wizard, select *No Subshelf* or select NVM 1 or 2 if this shelf will be a subshelf and click **Next** .

Result: The following confirmation message appears again. Since this is an initial installation, click **OK** to use default database.



22 On Screen 6 of 6 in the Maintenance Mode Wizard, click **Finish** to restart the system and apply the generic and default database.

Result: The Maintenance Mode Wizard closes and your connection to the shelf is terminated.

The LNW2 SYSCTL exhibits the following visible cycles while the generic and database are installed and validated and the SYSCTL reboots:

1. For approximately 20 minutes, the alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9 depending on your Maintenance Mode) and "**.**" (". " is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
2. After approximately 20 minutes, all LEDs extinguish and the **IND** display on the SYSCTL is blank for approximately 5 seconds.
3. A flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and the **IND** display is blank for approximately 20 seconds.
4. The **ACTIVE** LED lights and remains lighted.
5. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. After approximately 30 seconds, the **CR** LED flashes 10 times and then extinguishes, and the **b** continues flashing for approximately another 30 seconds.

23 What was the available default database on Screen 3 of 6 in the Maintenance Mode Wizard in Step 19?

If...	Then...
7.0.x 7.1.x 8.0.x 9.0.x	You have a valid database. The SYSCTL continues to exhibit the following visible indicators: • The **IND** display is blank. • The **ABN** and **NE** LEDs light and remain lighted for approximately 6 minutes. The active generic and database are validated and copied to the second NVM. • When the **ABN** and **NE** LEDs extinguish and only the **ACTIVE** LED is lighted, and nothing appears in the **IND** display, the NE software and database installation is complete. • Proceed to Step 32.
6.0.x	You now have an invalid database because the default database does not match the 9.1.x that is now active on NVM1. The SYSCTL continues to exhibit the following visible indicators: • The alternating **M** and **P** and **9** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0** appear in the **IND** display on the SYSCTL. • The **MN**, **ABN**, and **NE** LEDs light and remain lighted. The **MN** LED indicates that the database is invalid. • Continue with Step 24 to repeat the Maintenance Mode Wizard and select the default 9.1.x database that is now available.

24 If necessary, close the Maintenance Mode Wizard. From the Screen 6 of 6 in the Maintenance Mode Wizard, click **Cancel** and click **Yes** in the confirmation window.

Result: The *Maintenance Mode Wizard* closes.

25 In the Network View, right-click the LT-DMX NE icon and select **Graphical Using → OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

26 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

27 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

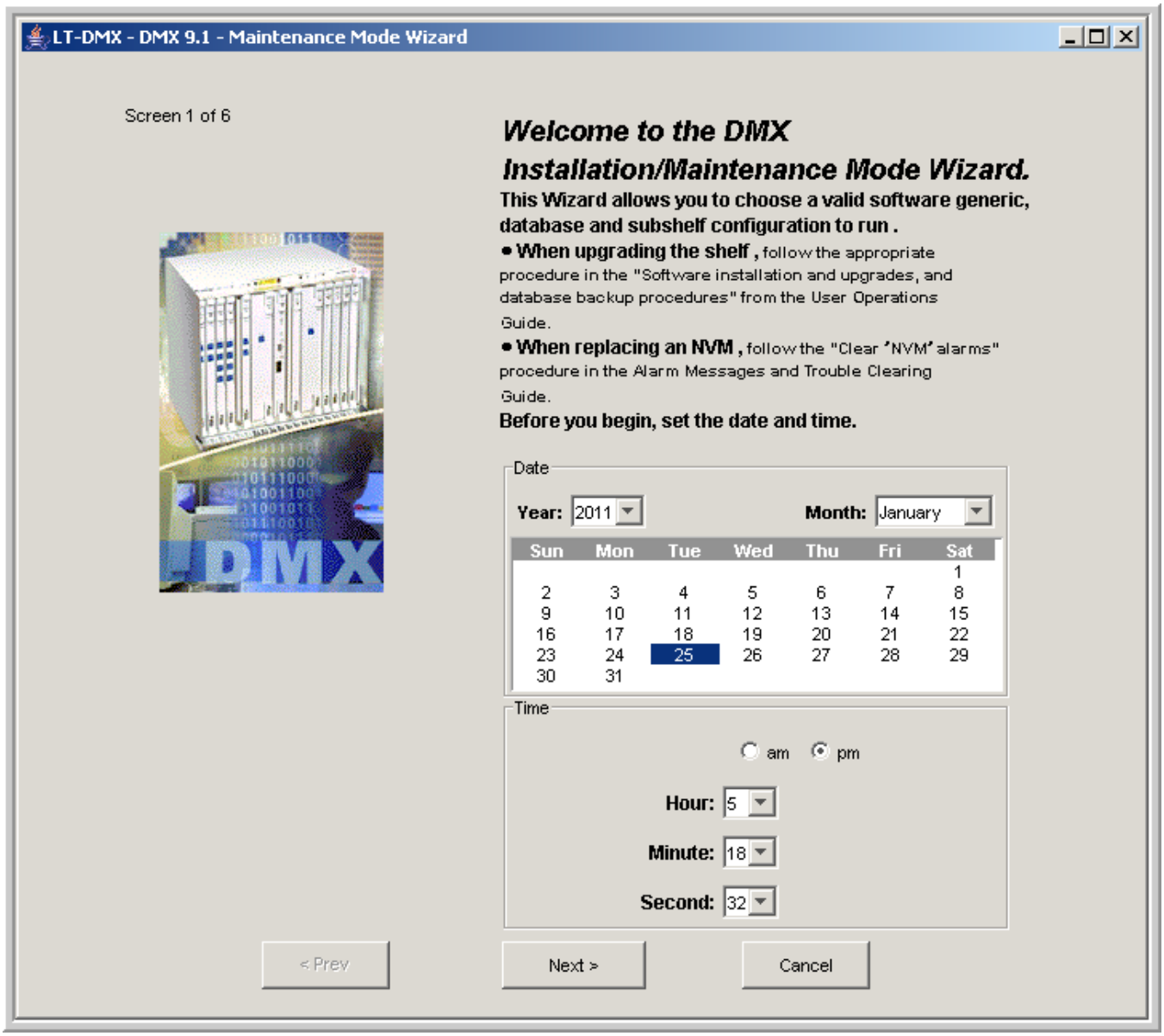
User ID: ***LUC01***

Password: ***DMX2.5G10G***

Click **OK**.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

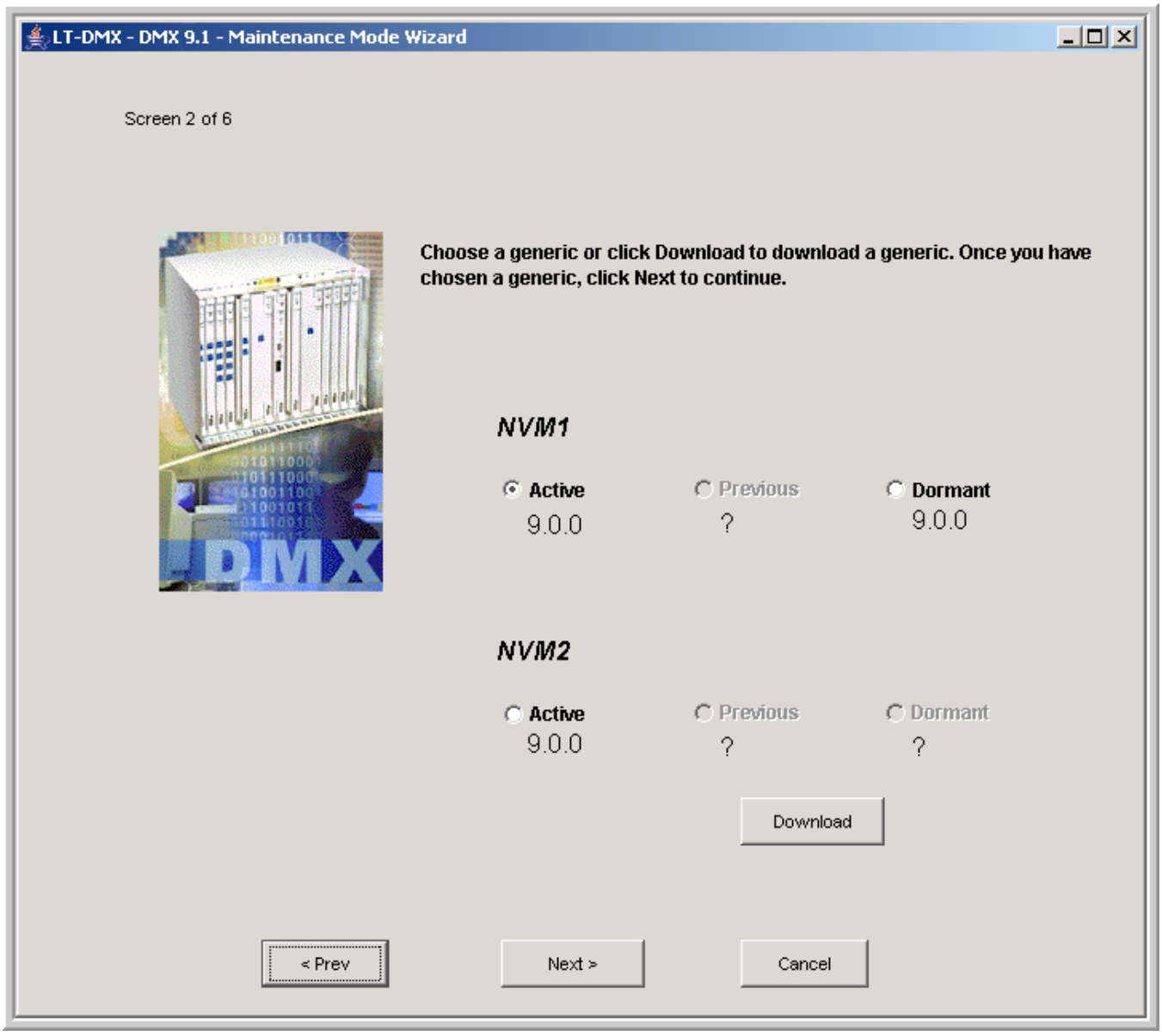
The title bar of the Maintenance Mode Wizard displays DMX 9.0.



28 **Important!** The actual time and date are preset from your PC.

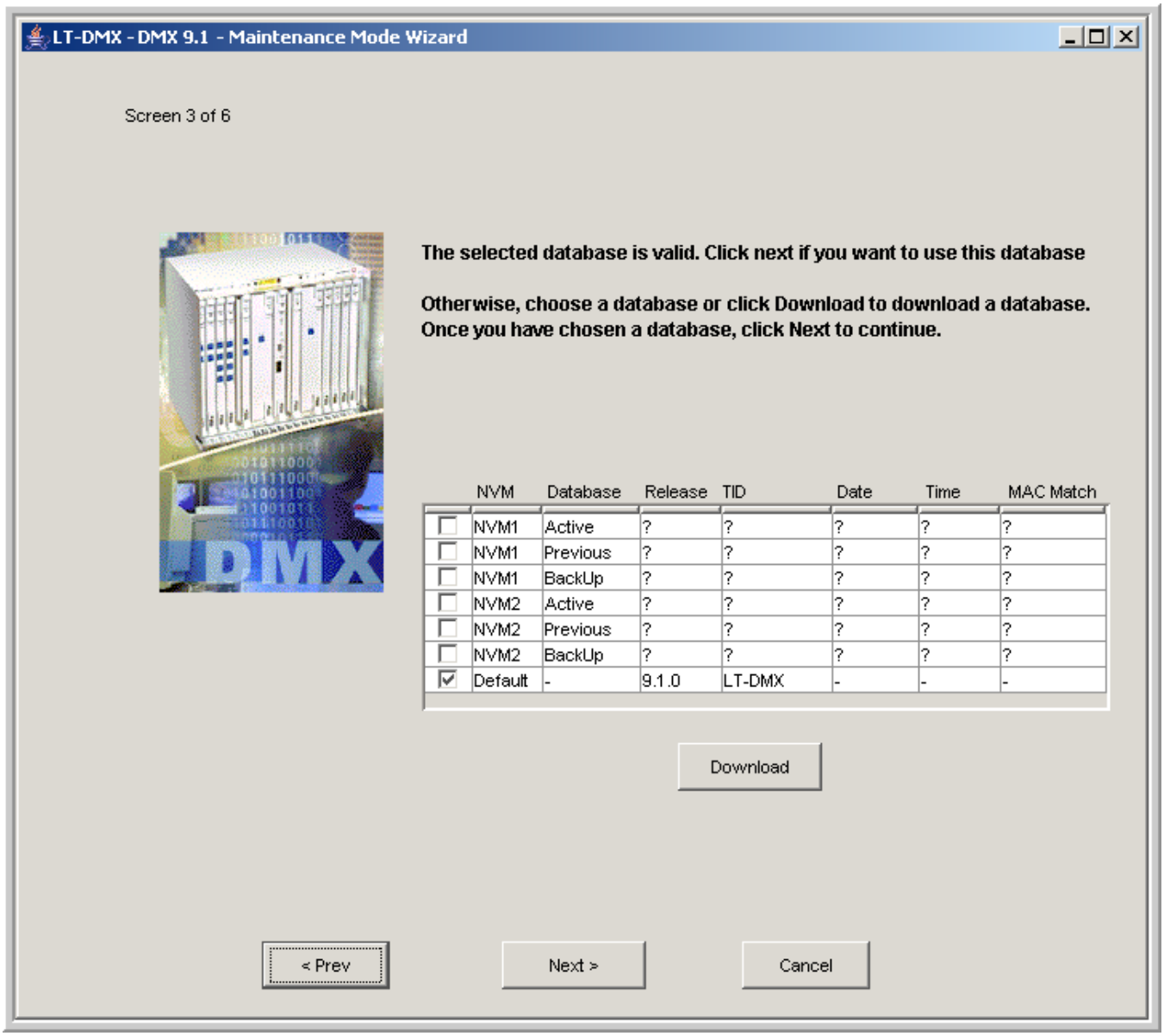
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



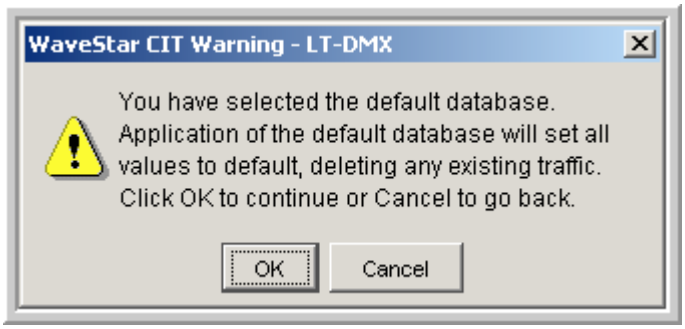
29 On Screen 2 of 6 in the Maintenance Mode Wizard, select **Active** on NVM1, and and click **Next**.

Result: Screen 3 of 6 in the Maintenance Mode Wizard appears. Your default database is 9.1.x.

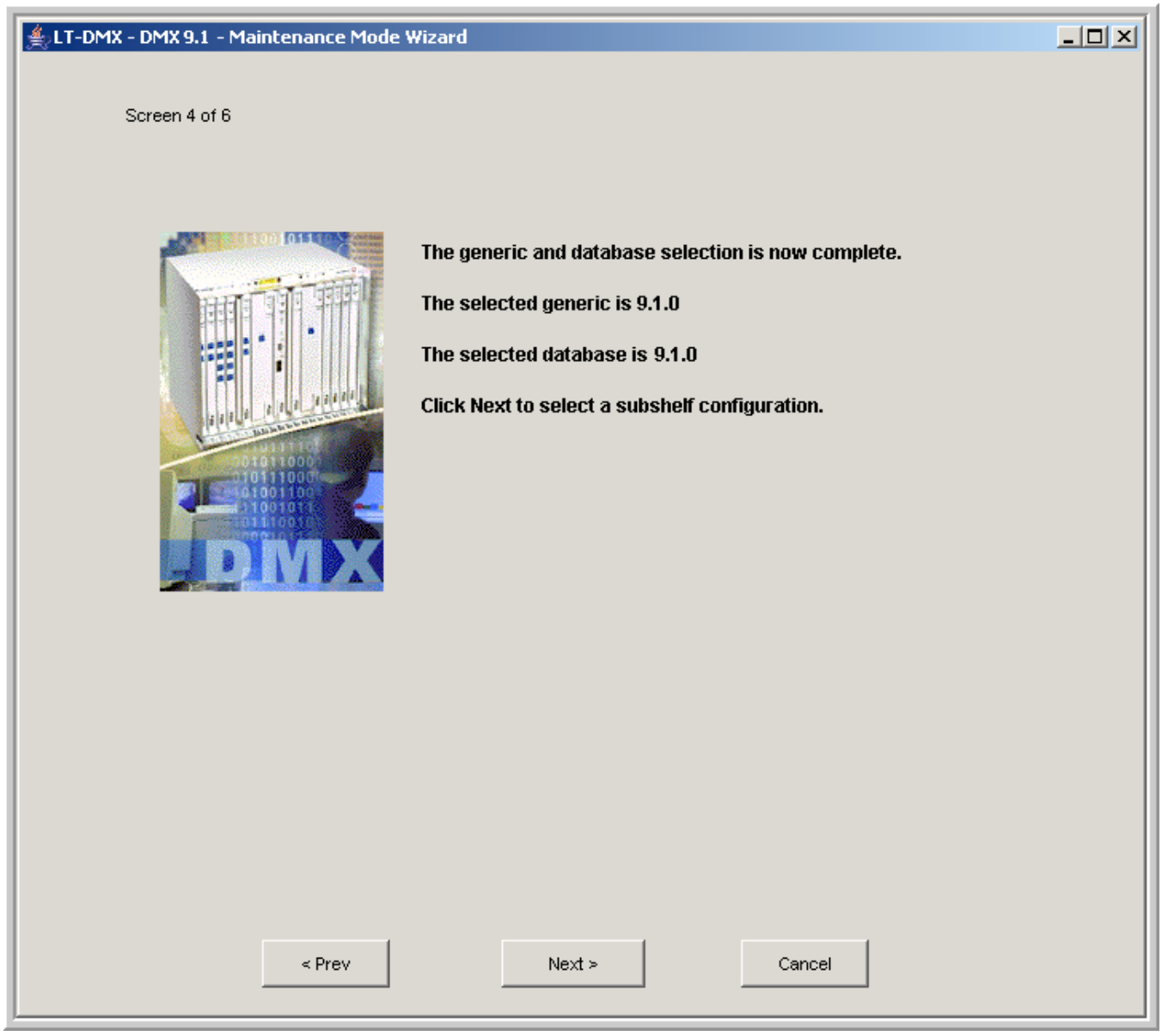


30 On Screen 3 of 6 in the Maintenance Mode Wizard, click the check box next to *Default* to create a default 9.1.x database and click **Next**.

Result: When you select the default database, the following confirmation message appears. Since this is an initial installation, click **OK** to use default database.



Result: Screen 4 of 6 in the Maintenance Mode Wizard appears.



31 Repeat the procedure from Step 20.

32 To verify that the download was successful, depress and hold the **ACO TEST** push-button on the LNW2 SYSCTL for about 4 seconds.

Result: All LEDs on the shelf light. A red, 35-segment (5 x 7) rectangle appears in the **IND** display on the SYSCTL. Since the **IND** display is a 35-segment display, this test indicates all segments are working.

33 Release the **ACO TEST** push-button on the LNW2 SYSCTL when the red rectangle disappears in the **IND** display.

Result: The current software generic appears in the **IND** display on the LNW2 SYSCTL and the shelf LEDs return to their previous status.

34 From the Network View of the *WaveStar*® CIT session you established in Step 4, select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

35 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

36 In the Network View, right-click the LT-DMX NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

37 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

38 Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

Password: ***DMX2.5G10G***

Click **OK**.

Note: LUC01, LUC02, and LUC03 are the default privileged User IDs, and DMX2.5G10G is the default privileged password for Alcatel-Lucent 1665 DMX. To preserve the security of your equipment, it is highly recommended that you change all three logins and passwords during your first session after completing this initial installation procedure.

Result: The title bar of the System View and the legal notice text both reflect the current NE software generic, for example: 9.1.0.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

39 Is the Generic Software Version correct?

If...	Then...
Yes	STOP! End of Procedure.
No	Contact your next level of support.

END OF STEPS

Procedure 2-3: Ugrade software generic via SFTP

Overview

Use this procedure to upgrade the software generic from Release 9.0.1 to 9.1.x via SSH FTP (SFTP). Replace 9.1.x with your current release, for example 9.1.1.

Important! Your NE must be running Release 9.0.x or later to use this procedure.

Important! When performing this software upgrade, you may experience transmission hits within typical protection switch times (up to 60 ms).

To download the software generic to a remote shelf using SFTP, refer to Procedure 2-3: "Ugrade software generic via SFTP" (p. 2-58).

To download the software generic to a remote shelf using FTP, refer to Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93).

To download the software generic to a remote shelf using FTTD, refer to Procedure 2-6: "Upgrade software generic via FTTD" (p. 2-130).

To download the software generic to a local or remote shelf using FTAM, refer to Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62).

Note: You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to "Required equipment" (p. 2-2) listed in this chapter, the following equipment is also required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** port.
- Copy of the new system generic software program on your SFTP server.
- Current Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description for the software generic being installed.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 2-2) in this chapter and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Verify that the new software generic program is available.
3. Refer to the Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description for the software being downloaded for a description of any special considerations involving this version of software.

If you log in using TCP/IP, your PC must be part of the GNE's TCP/IP Gateway Host List. Refer to Procedure 7-16: "Provision/enable/disable the NE as a TL1 TCP/IP GNE" (p. 7-46).

Steps

Complete the following steps to download system software using SFTP.

1 Establish a *WaveStar*® CIT session (depending on the physical connection used) and log in to the destination shelf (the shelf to which you want to download the software) in your network.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 From the System View menu, select **View** → **Software Generic**.

3 Is the Active Software Version 9.0.1 or later?

If...	Then...
Yes	Continue with Step 4.
No,	You must upgrade your software to Release 9.0.1 and then repeat this procedure from Step 1.

4 From the System View menu, select **Configuration** → **Software** → **Download Software**.

Result: The *Download Software* window opens.

5 In the pull-down **Download From/Via:** menu, select **SFTP**. Select a connection profile from the **Profile** pull-down menu and proceed to Step 7. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the SFTP server.
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 22 is valid if entered.
3. In the **User** panel, enter the user name and password for the SFTP server.

6 If you entered connection information in Step 5 and wish to keep the information for future backups:

1. Enter a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

Important! Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply,** and **Save** buttons or removed using the **Delete** button.

7 In the **Source/Destination Directory Path** panel, enter the path starting at the SFTP home directory on the server.

8 Click **OK**.

Result: A warning message appears indicating the transfer you are about to execute. *Do you wish to continue?* Verify the information and click **Yes**. While the download is in progress, a *Progress Indicator* window is present.

The download takes approximately 5 minutes.

The download may be cancelled any time by clicking **Cancel** on the *Progress Indicator* window.

When the transfer is complete, the *Progress Indicator* window closes and the download software successful screen appears. Click **OK**.

9 **Important!** Do NOT insert a new circuit pack in the shelf until after you apply the new software generic and clear the `dormant/exec version mismatch` condition.

Do you wish to apply (activate) the software generic that you recently downloaded to the dormant area of the Alcatel-Lucent 1665 DMX shelf?

If...	Then...
Yes	Proceed to Procedure 2-8: "Apply software generic" (p. 2-141) and then continue with Step 10.
No	Continue with Step 10.

10 Do you wish to upgrade additional shelves using SFTP?

If...	Then...
Yes	Repeat this procedure from Step 1 for each shelf that you wish to upgrade using SFTP.
No	STOP! End of Procedure.

END OF STEPS

Procedure 2-4: Upgrade software generic via FTAM

Overview

Use this procedure to upgrade the software generic to Release 9.1.x via the File Transfer and Access Management (FTAM) protocol.

Note: You can upgrade directly to 9.1.x from the following releases:

- R5.1.3/5.1.7
- R7.1.2
- R8.0.2/R8.0.3/8.0.4/8.0.5/8.0.6
- R9.0.1

You must complete a two-step upgrade to 9.1.x from the following releases:

- R6.0.1/6.0.2/6.0.4 through R8.0.5
- R7.0.2 through R8.0.5
- R7.1.1/7.1.4 through R8.0.6

You must complete a three-step upgrade to 9.1.x from R5.1.4/5.1.5 through R7.0.2, and then through R8.0.5.

To download the software generic to a local shelf using SFTP, refer to Procedure 2-3: “Ugrade software generic via SFTP” (p. 2-58).

To download the software generic to a local shelf via FTP, refer to Procedure 2-5: “Upgrade software generic via FTP” (p. 2-93).

To download the software generic to a remote shelf via FTTD, refer to Procedure 2-6: “Upgrade software generic via FTTD” (p. 2-130).

Important! You must have OSI connectivity (via your OSI LAN or DCC) to the network element to use FTAM.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to “Required equipment” (p. 2-2) listed in this chapter, the following equipment is also required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port (required for TCP/IP connectivity)
- Copy of the new system generic software program accessible from your PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).

- Factory-fresh LNW2, system controller (SYSCTL), with two factory-installed non-volatile memory (NVM) cards installed
- Current *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed

Before you begin

Before performing this procedure:

1. Refer to "Before you begin" (p. 2-2) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Verify that new software generic program is available.
3. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for a description of any special considerations required when installing this version of software.
4. The SYSCTL must have Alcatel-Lucent 1665 DMX 5.1.3 or later software generic to upgrade the software generic program to 9.1.x via FTAM.

Steps

Complete the following steps to upgrade the software generic via the FTAM protocol.

1 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

Double-click the *WaveStar*® CIT icon on your desktop and login (if necessary), to start the *WaveStar*® CIT software on the PC. Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

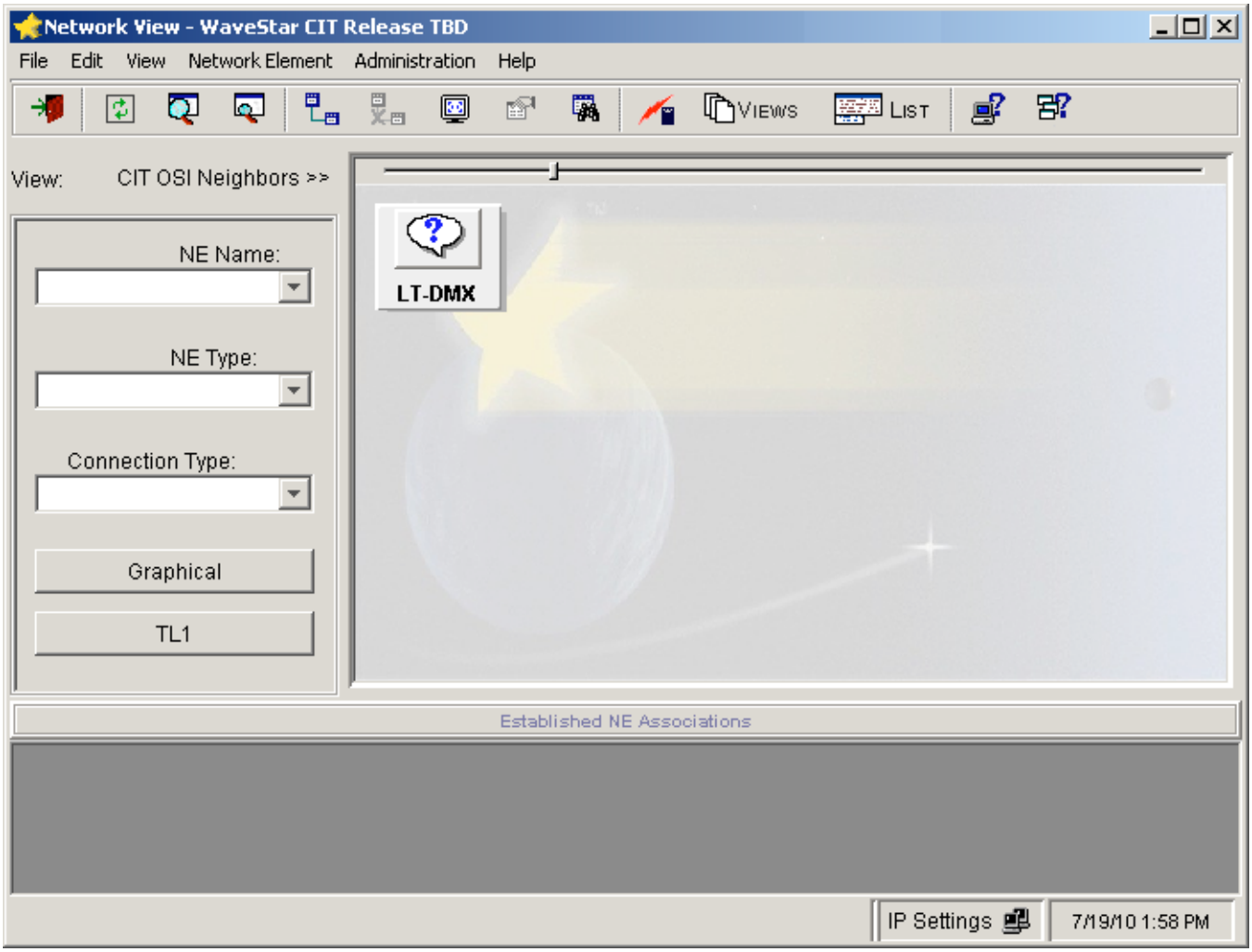
Result: The *Network View* appears.

2 From the **View:** pull-down menu, select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI neighbor(s) are automatically detected.

If you were previously logged in to the NE and/or you do not see your NE, from the Network View, select **View** → **Refresh OSI View**.



3 In the Network View, right-click the NE icon that was detected (default TID is LT-DMX, your TID can be different), and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

4 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

5 In the NE login window, login to the shelf using your user ID and password. Click **OK**.

6 From the System View menu, select **View** → **Equipment**, highlight the SYSCTL, and click **Select**.

Result: The *View Equipment* window appears. Record the Apparatus Code and the Program Version.

7 What is the apparatus code of your SYSCTL and what program version (software generic Release x.x.x) is it currently running?

If...	Then...
Apparatus Code = LNW1 Program Version = 3.1, 4.0, 5.0	You must upgrade your software to Release 5.1.3 and then repeat this procedure from Step 1.
Apparatus Code = LNW1 Program Version = 5.1.3/5.1.7	Proceed to Procedure 2-4.1: "Verify proper equipage in Main slots" (p. 2-66).
Apparatus Code = LNW1 Program Version = 5.1.4/5.1.5	You must upgrade your software to Release 7.0.2 and then repeat this procedure from Step 1.
Apparatus Code = LNW2 Program Version = 6.0.x (x=1, 2, 4) or 7.0.2	You must upgrade your software to Release 8.0.6 and then repeat this procedure from Step 1.
Apparatus Code = LNW2 Program Version • 7.1.x (x=1, 2, 4) • 8.0.x (x=2, 4, 5, 6) • 9.0.1	Proceed to Procedure 2-4.3: "Upgrade software generic via FTAM (7.1.x, 8.0.x, 9.0.1 or later to 9.1.x)" (p. 2-90).

END OF STEPS

Procedure 2-4.1: Verify proper equipage in Main slots

Overview

Use this procedure to verify that the Main slots are equipped with circuit packs that are supported in 9.1.x.

LNW26 circuit packs are not supported in 9.1.x.

Since LNW26B-type circuit packs with the jumper set to *NORMAL* are identical to LNW26 circuit packs, LNW26B-type circuit packs (LNW26B, LNW28, LNW77, LNW121B-151B) with the circuit pack mode jumper set to *NORMAL* (six STS-1 switch fabric) are not supported in 9.1.x. The jumper on LNW26B-type circuit packs must be set to *ENHANCED* (12 STS-1 switch fabric) to use these circuit packs in 9.1.x.

Important! If you determine that the Main slots in your NE are equipped with unsupported circuit packs, you must upgrade those circuit packs before upgrading to 9.1.x.

Required equipment

Refer to "Required equipment" (p. 2-62) in Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure:

1. Complete Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62).
2. If your Main slots contain unsupported circuit packs, you must have access to supported circuit packs.

Steps

Complete the following steps to verify that supported equipment is installed in your shelf.

1 From the System View menu, select **Reports** → **Equipment Lists** → **Pack**, highlight **Shelf**, and click **Select**.

Result: The *Circuit Pack List* screen appears.

2 In the *Circuit Pack List* screen, locate the *main-1-cp* and *main-2-cp* AIDs in the Circuit Pack AID column. Are the Apparatus Codes for those AIDs either LNW26 or LNW26B-type (LNW26B, LNW28, LNW77, LNW121B-151B)?

If...	Then...
Yes (LNW26)	You must upgrade the LNW26 circuit packs in the Main slots to supported circuit packs. Proceed to Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5) and then repeat this procedure.
Yes (LNW26B, LNW28, LNW77, LNW121B-151B)	Continue with Step 3 to determine the circuit pack mode of the packs.
No	The Main slots are equipped with circuit packs that are compatible with 9.1.x. Proceed to Procedure 2-4.2: "Upgrade software generic via FTAM (5.1.3/5.1.7 to 9.1.x)" (p. 2-69).

3 From the System View menu, select **View** → **Equipment** → **Circuit Pack**, highlight CP main-1, and click **Select**.

Result: The *View Equipment* screen appears.

4 In the *View Equipment* screen, locate the Circuit Pack Mode parameter in the Equipment Details panel. Note the value of the Circuit Pack Mode for CP Main-1, either *NORMAL, or ENHANCED*.

Do NOT click **Close** on the *View Equipment* screen.

5 Highlight CP main-2 and click **Select**.

6 In the *View Equipment* screen, locate the Circuit Pack Mode parameter in the Equipment Details panel. Note the value of the Circuit Pack Mode for CP Main-2, either *NORMAL, or ENHANCED*.

7 Refer to Step 4 and Step 6. Is the Circuit Pack Mode for CP main-1 and/or CP main-2 *NORMAL* (six STS-1 switch fabric)?

If...	Then...
Yes	The LNW26B-type circuit packs with the Circuit Pack Mode jumper set as *NORMAL* are NOT supported in 9.1.x. Choose one of the following two options: 1. Change Circuit Pack Mode to *ENHANCED* by physically changing the jumper setting on the circuit packs. Proceed to Procedure 4-22: "Change circuit pack mode of LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs" (p. 4-113) and then repeat this procedure. 2. Upgrade the LNW26B-type circuit packs to LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs. These circuit packs can cross-connect VT1.5 signals in up to 48 STS-1 signals. Refer to Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5) and then repeat this procedure.
No	The LNW26B-type circuit packs with the Circuit Pack Mode jumper set as *ENHANCED* are supported in 9.1.x. Proceed to Procedure 2-4.2: "Upgrade software generic via FTAM (5.1.3/5.1.7 to 9.1.x)" (p. 2-69) to upgrade the 5.1.x shelf to 9.1.x.

END OF STEPS

Procedure 2-4.2: Upgrade software generic via FTAM (5.1.3/5.1.7 to 9.1.x)

Overview

Use this procedure to upgrade a software generic from Release 5.1.3/5.1.7 to Release 9.1.x via FTAM.

Required equipment

Refer to "Required equipment" (p. 2-62) in Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure:

1. Complete Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62).
2. You must be able to perform a backup of the R5.1.x database.

Steps

Complete the following steps to upgrade a software generic from Release5.1.3/5.1.7 or later to Release 9.1.x.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **FTAM**.

3 In the **Source/Destination Directory Path** field, enter **`\backups\<filename>`**.

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

4 Click **OK**.

You are asked to verify that you wish to backup to the directory that you entered. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears, indicating that the backup is in progress. When the backup completes, a `Remote Backup successful` screen appears. Click **OK**. The backup file is now stored. If the default path and a subdirectory were used, the file can be found at:

```
C:\Program Files\Alcatel-Lucent\\WaveStar CIT\backups\
<subdirectory>\<filename>
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

5 Close your *WaveStar*® CIT session with the 5.1.x NE. From the System View, select **File** → **NE Disconnect** and click **Yes** in the confirmation window.

Result: The *System View* closes.

6 Disconnect the LAN and/or serial cables from the **LAN** and/or **RS232** port(s) on the front of the LNW1 SYSCTL.

7 Initiate a ten-second countdown (9, 8, 7, 6, 5, 4, 3, 2, 1, 0) in the **IND** display on the LNW1 SYSCTL by simultaneously depressing the **ACO TEST** and **SEL** buttons on the front of the LNW1 SYSCTL.

Important! Removing the LNW1 without initiating the ten-second countdown can result in unexpected and undesirable protection switches, incorrect circuit fault indications, or incoming signal failure alarms. All SYSCTL functions are suspended during the countdown.

8 Remove the LNW1 SYSCTL circuit pack during the 10-second countdown.

Important! While the SYSCTL circuit pack is removed, do *NOT* remove or replace any transmission circuit packs.

9 **Important!** For software installation, ensure that two NVMs are present in the LNW2 SYSCTL. After the LNW2 is installed, if one or two NVMs are missing, `NVM removed` alarm(s) are issued. If both NVM sockets are empty, the **IND** displays an alternating **E** and **0** and **1**.

Refer to Step 10 for the complete listing of codes and required actions.

Seat the new LNW2 SYSCTL circuit pack and allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 10 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and the **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.
4. Continue with Step 10.

10 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
alternating **M** and **P** and **6** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **7** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **7** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **1**	7.1 Maintenance Mode. Continue with Step 11.

If...	Then...
alternating **M** and **P** and **8** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **9** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **9** and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **1**	9.1 Maintenance Mode. Continue with Step 11.
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent-supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **1** and **0**	LNW2 SYSCTL does not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.

If...	Then...
alternating **N** and **O** and **x**	"x" indicates that the NVM socket (1 or 2) is empty or the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
Letter **U**	LNW2 SYSCTL does not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

11 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

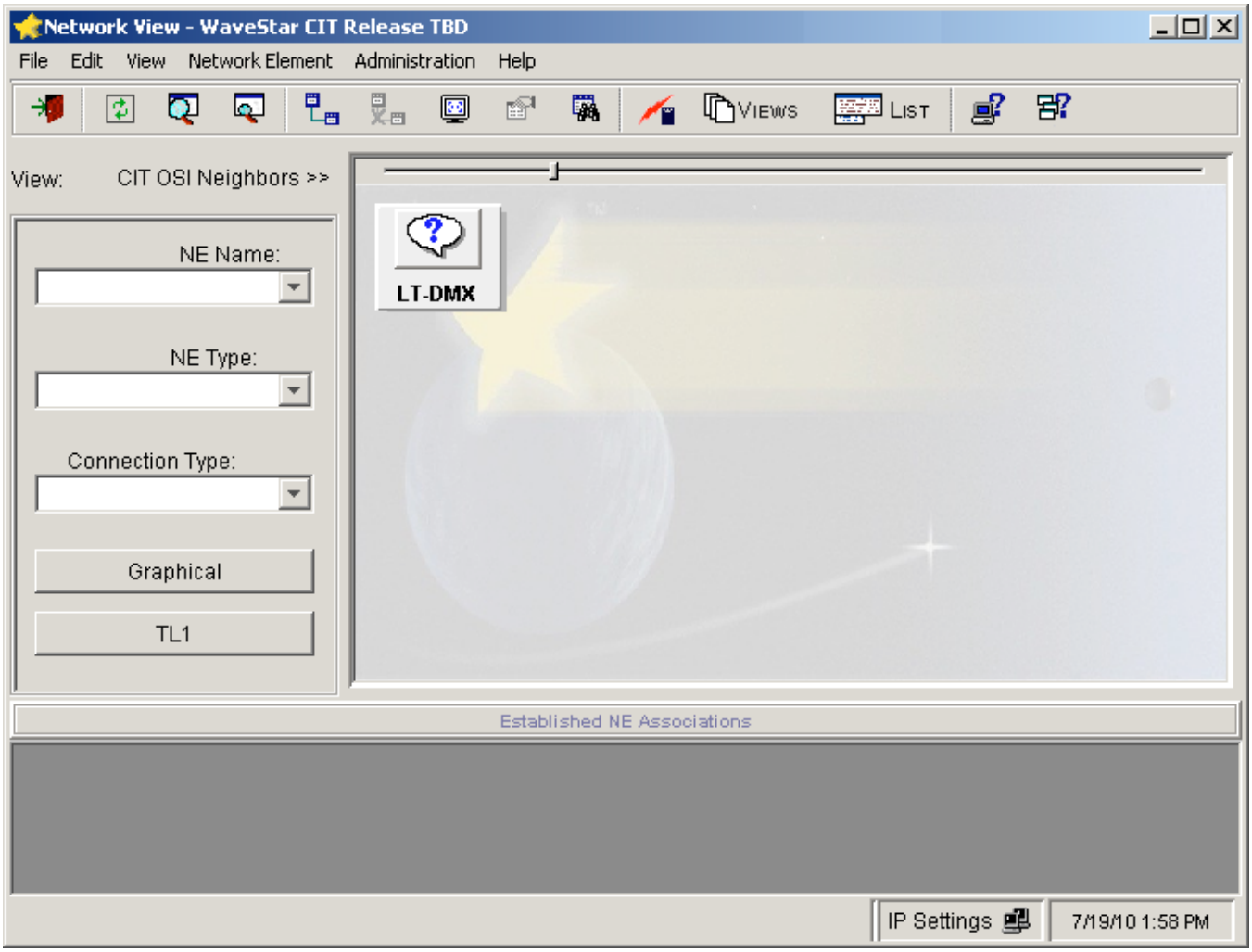
12 From the Network View of the *WaveStar*® CIT session you established in Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

13 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

Your TID is LT-DMX; when in Maintenance Mode, the TID is always default.



14 In the Network View, right-click the LT-DMX NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

15 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

16 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

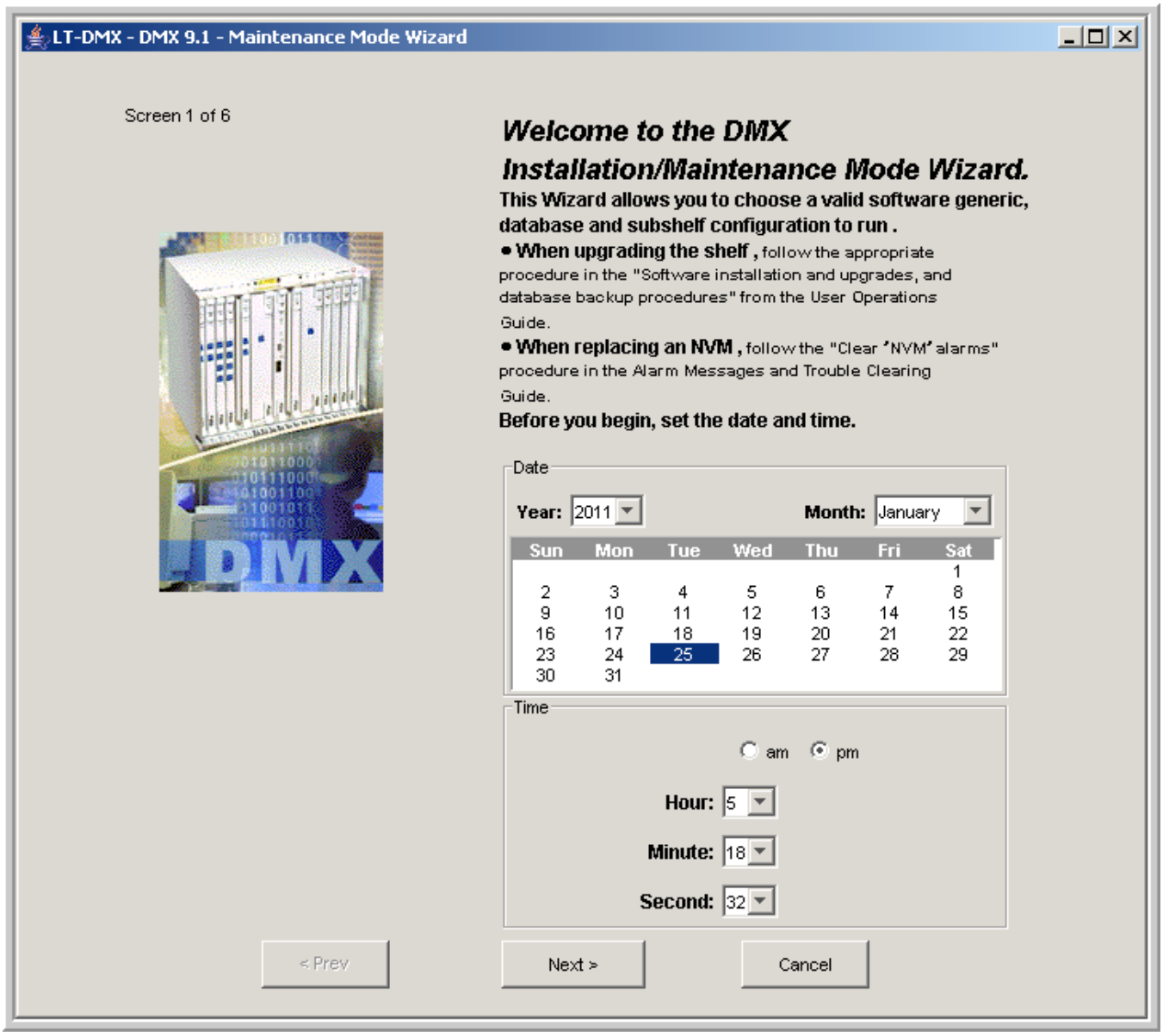
Password: ***DMX2.5G10G***

Click **OK**.

Important! After you select your backup database, complete the Maintenance Mode Wizard, and the NE restarts, your original User IDs and Passwords are restored.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 10), the title bar of the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0, DMX 9.0, or DMX 9.1



This screen picks up the time format preference from the *WaveStar*® CIT.

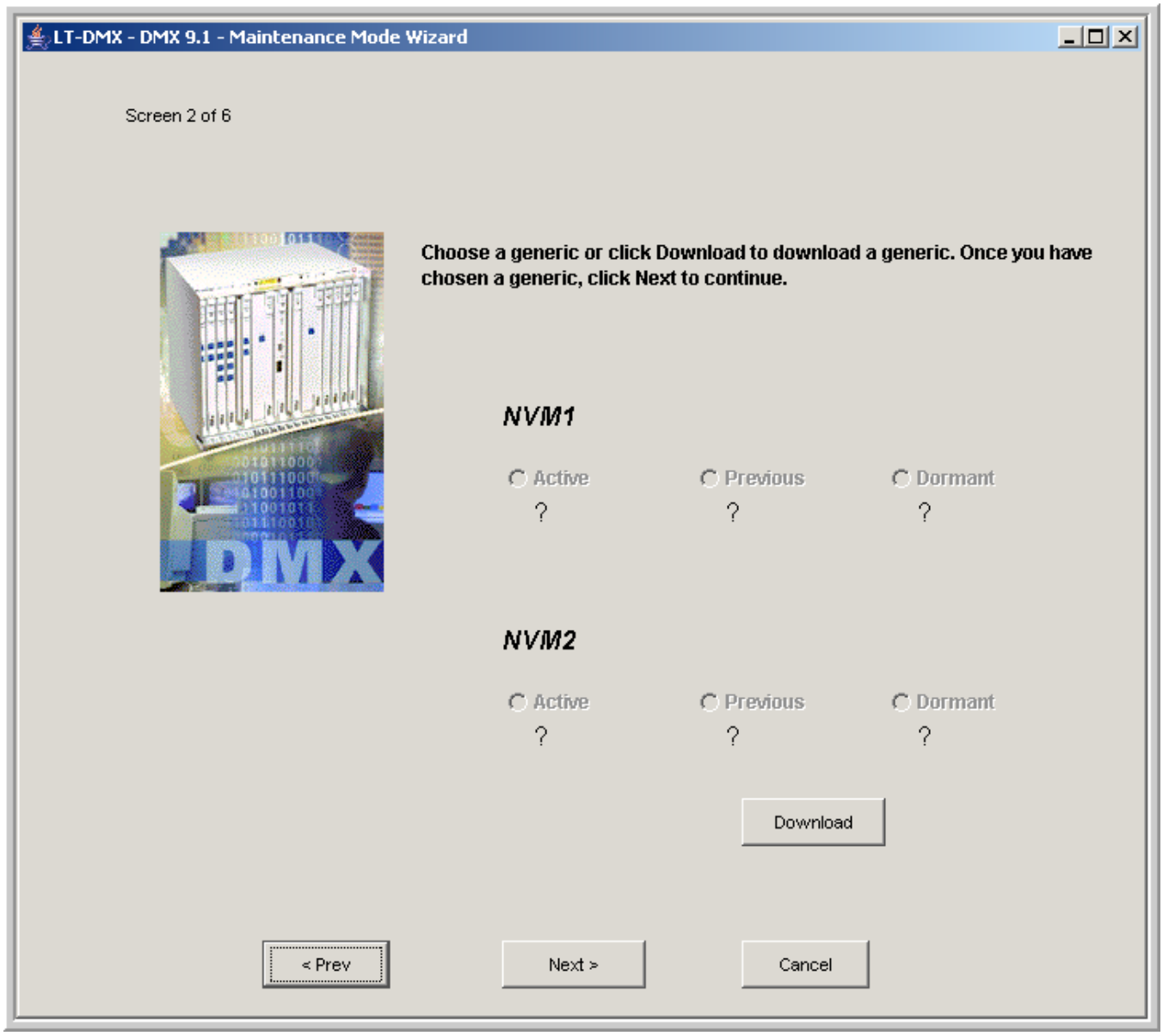
You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

17 **Important!** The actual time and date are preset from your PC.

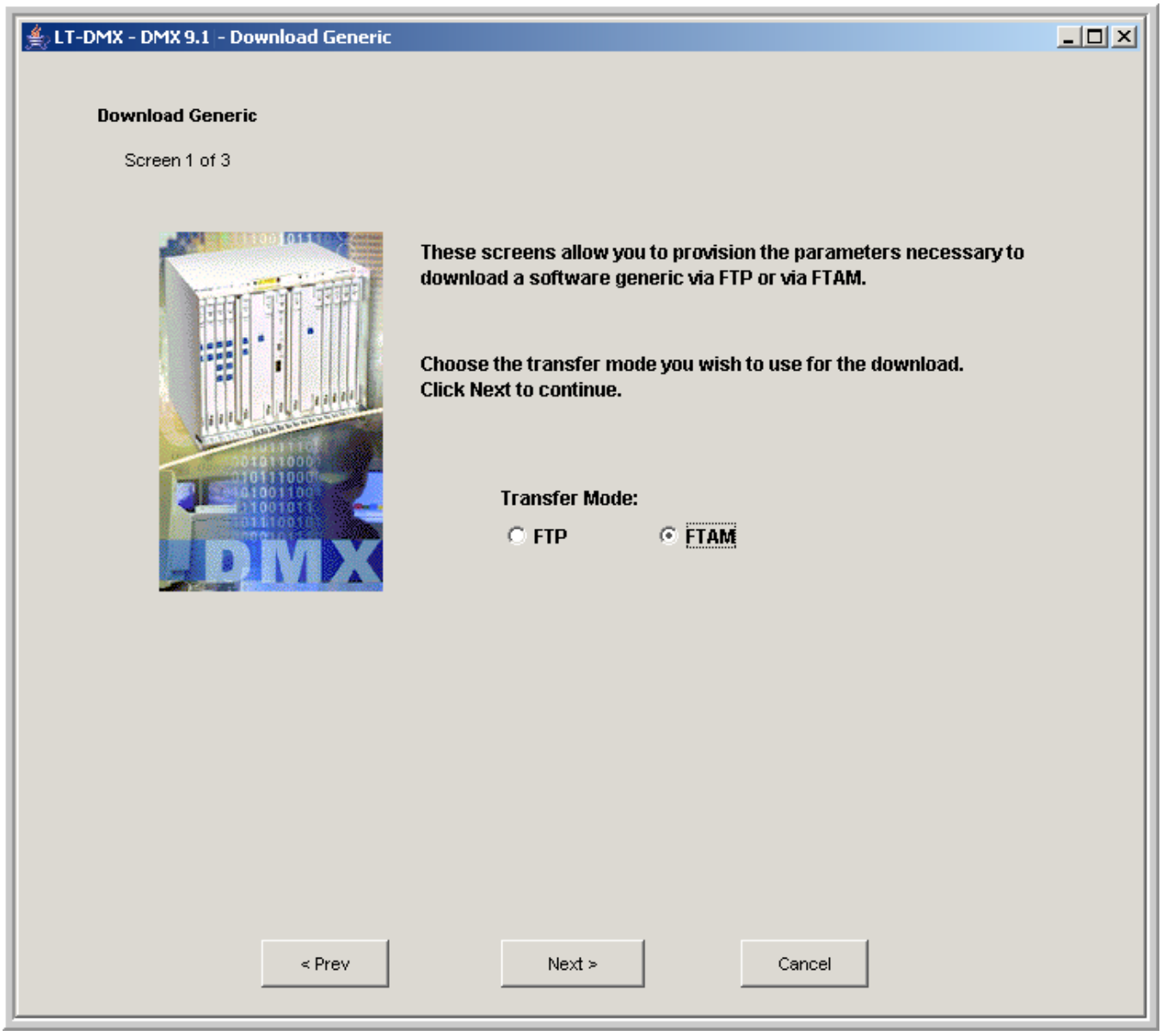
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



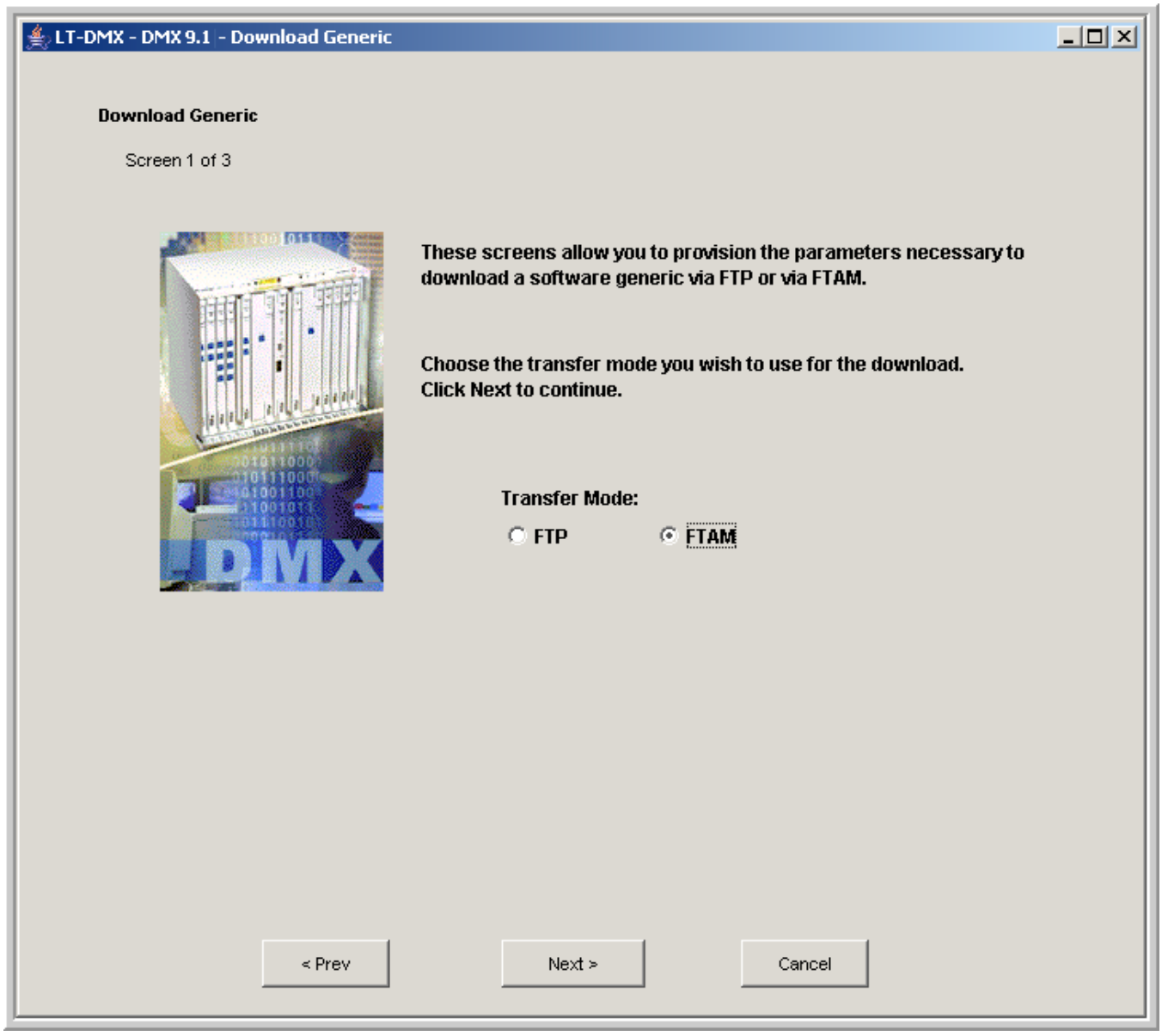
18 On Screen 2 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Generic Wizard appears.



19 On Screen 1 of 3 in the Download Generic Wizard, read the information, select **FTAM** and click **Next**.

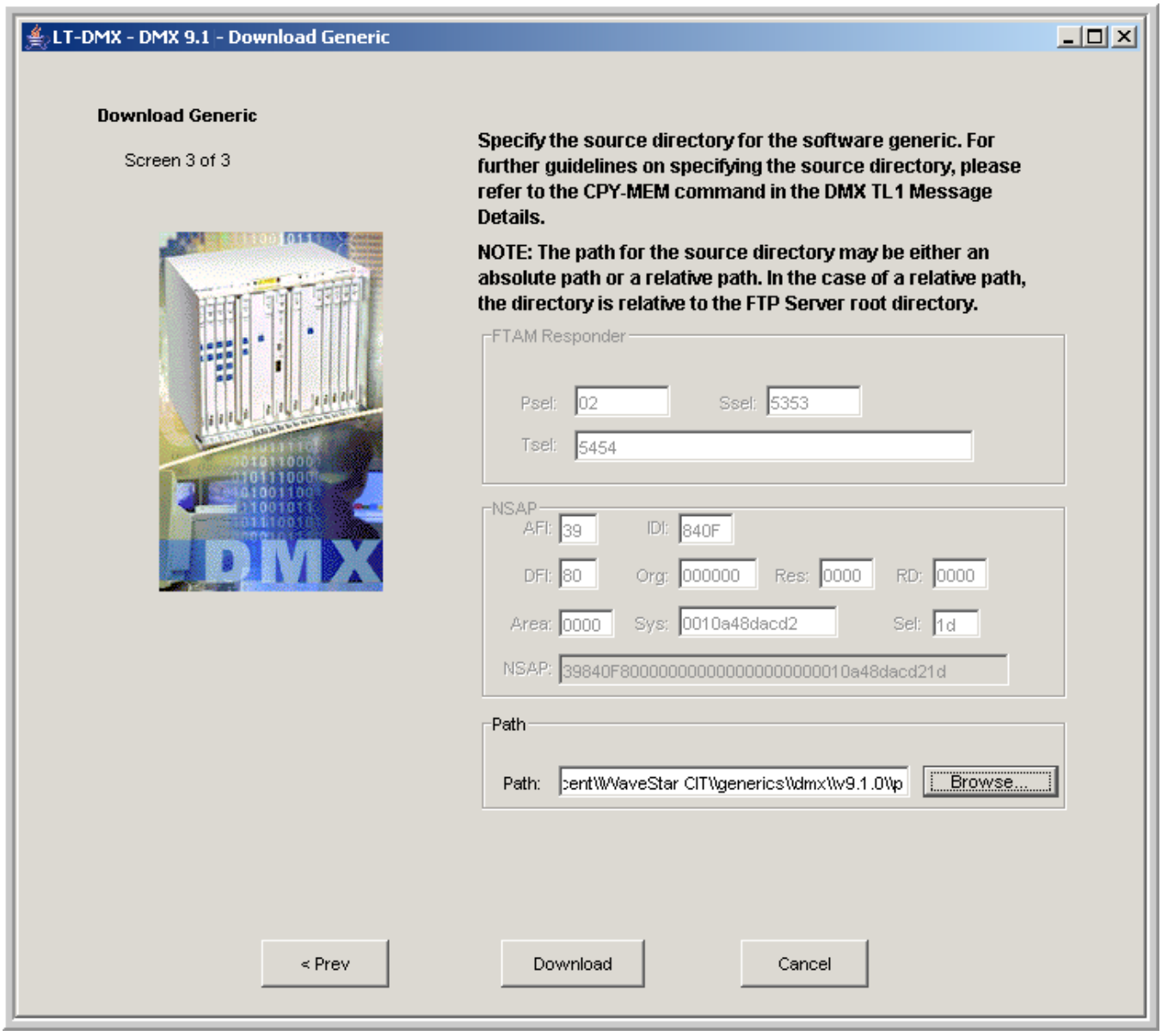
Result: Screen 2 of 3 in the Download Generic Wizard appears.



20 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

On Screen 2 of 3 in the Download Generic Wizard, read the information, verify that the LAN port you are connected to has OSI Function Enable selected, and click **Next**.

Result: Screen 3 of 3 in the Download Generic Wizard appears.



21 On Screen 3 of 3 in the Download Generic Wizard in the **Path** panel, enter the current location of the generic to be downloaded in the Path field or use the **Browse** button to select the generic to be downloaded. Click **Download**.

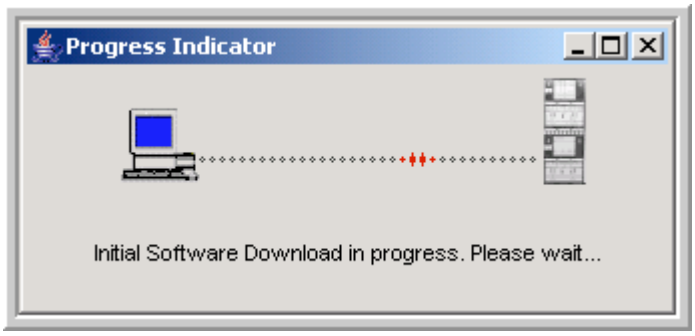
The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**. The syntax of the

relative path must start with the path name; for example: **\generics\DMX\9.1.0\p**. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

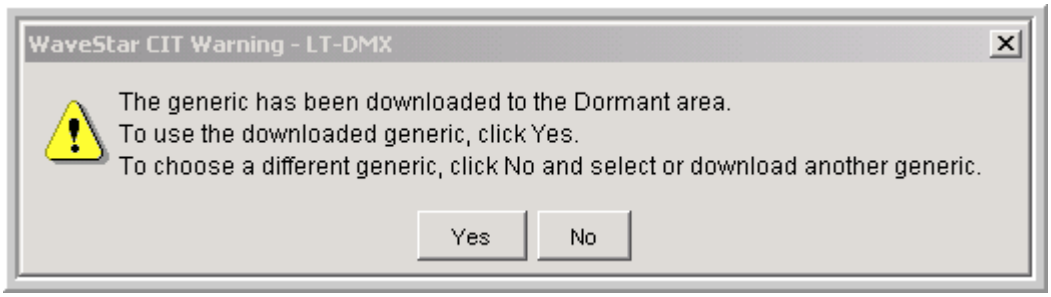
Result: A warning message appears listing the options you provisioned in the previous screens.

22 Verify the information and either click **Yes** to start the download process or click **No** to return to the download screen and change your selections.

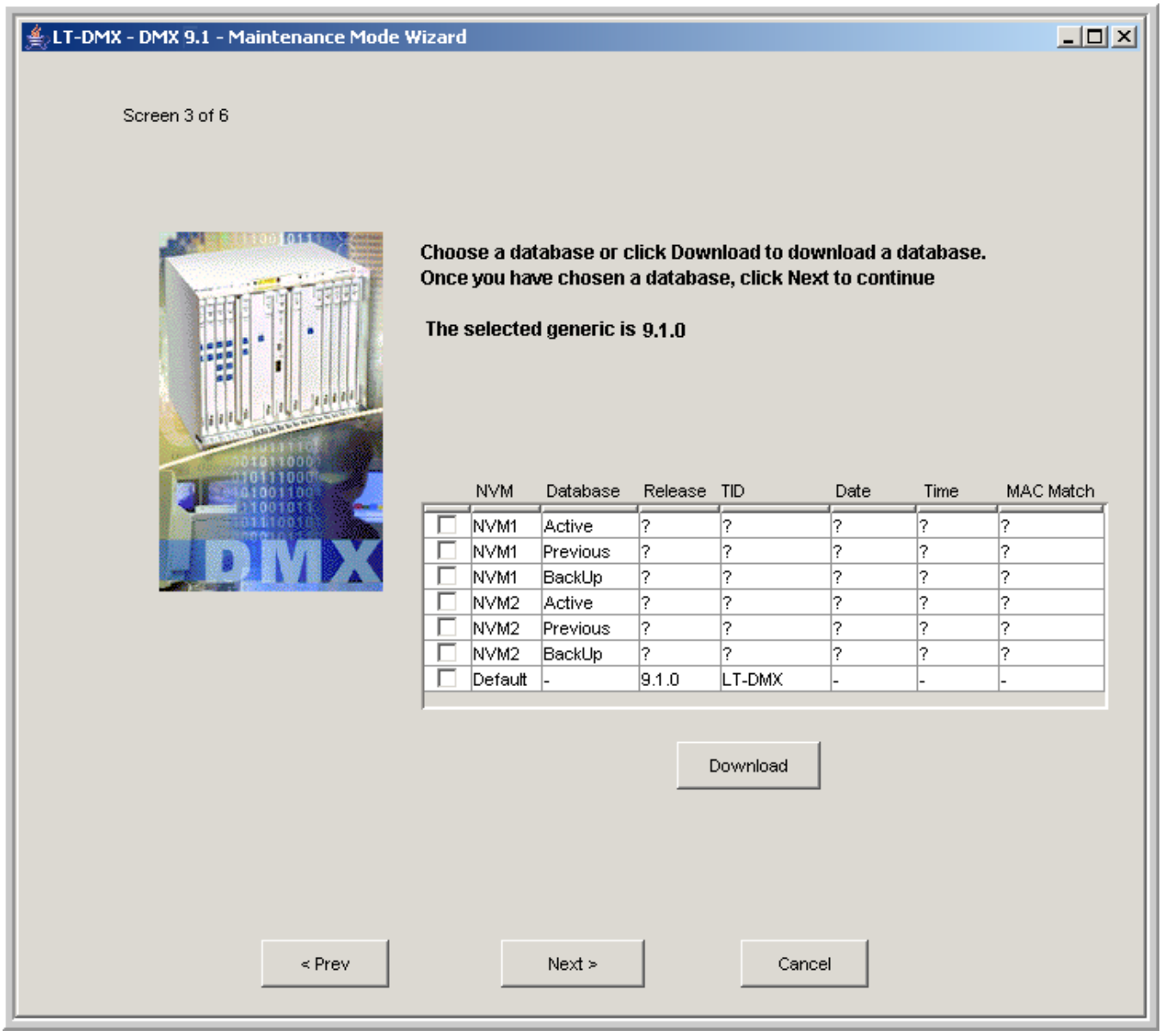
Result: If you choose yes, the following initial software download progress indicator runs for approximately 30 minutes.



23 Once the software generic download is complete, the following confirmation message appears. Click **Yes** to use the generic that is now in the Dormant area.



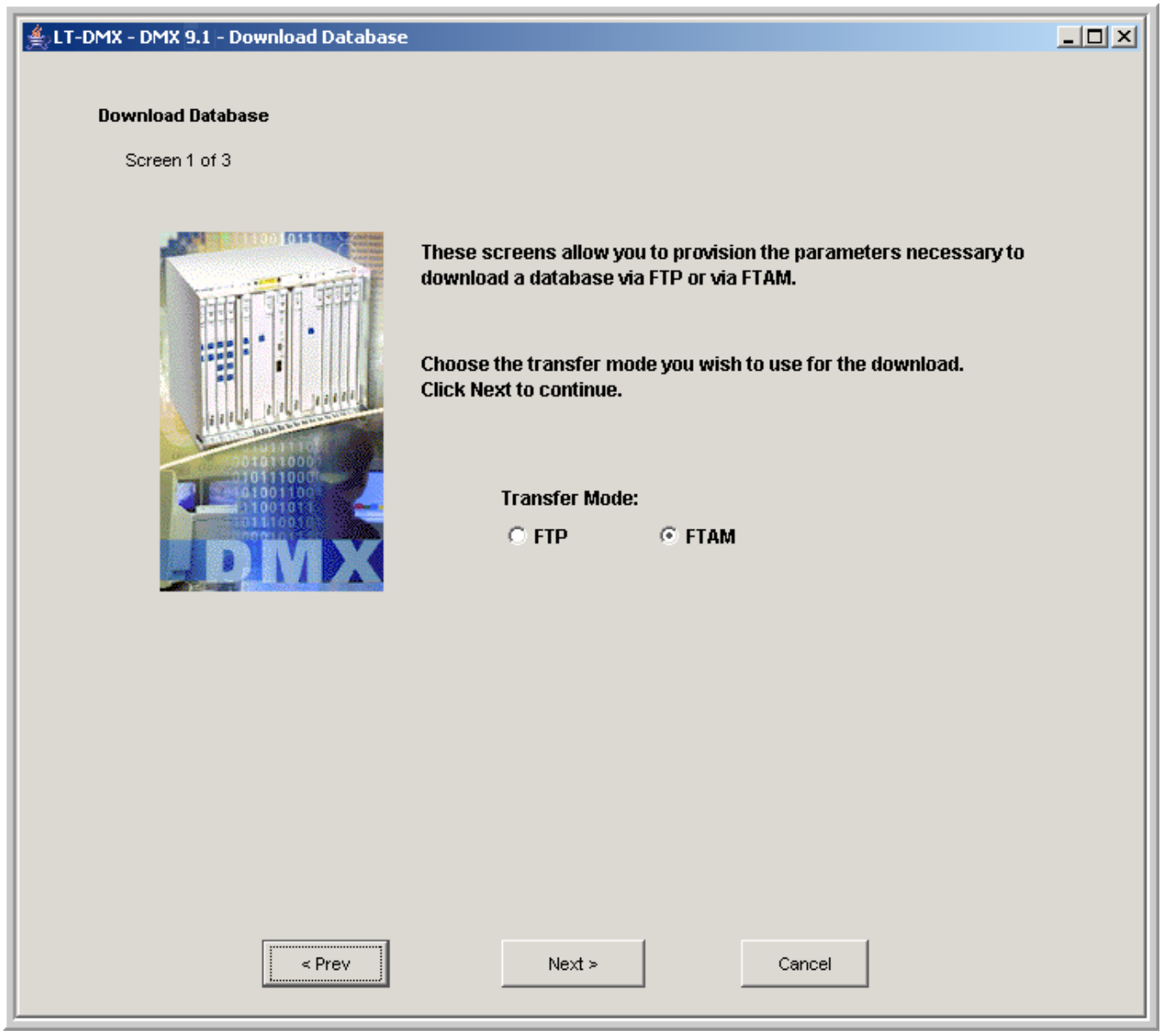
Result: Screen 3 of 6 in the Maintenance Mode Wizard appears.



24 **Important!** Do NOT select the default database or you could loose service to your shelf. You MUST download your previously backed up database.

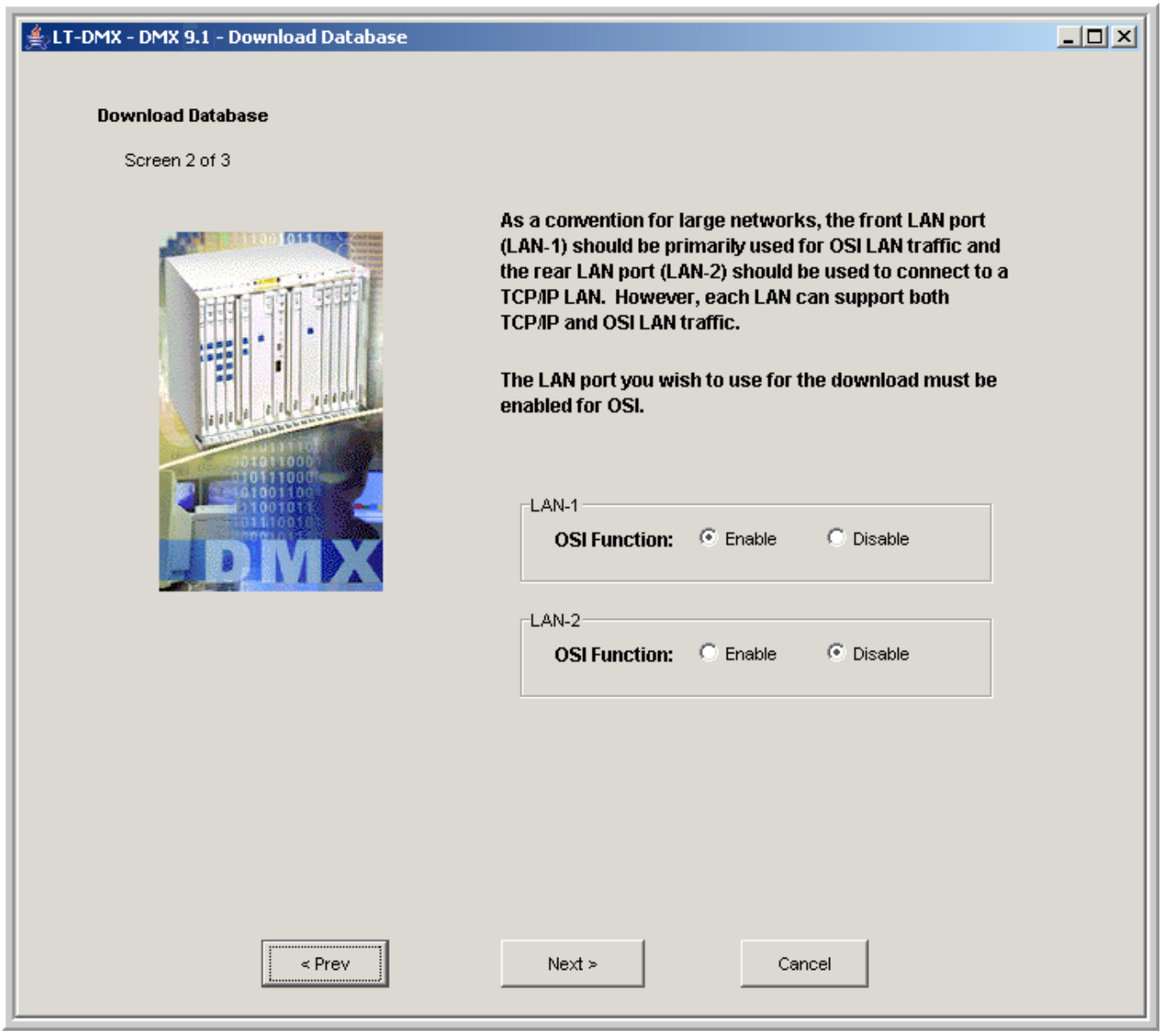
On Screen 3 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Database Wizard appears.



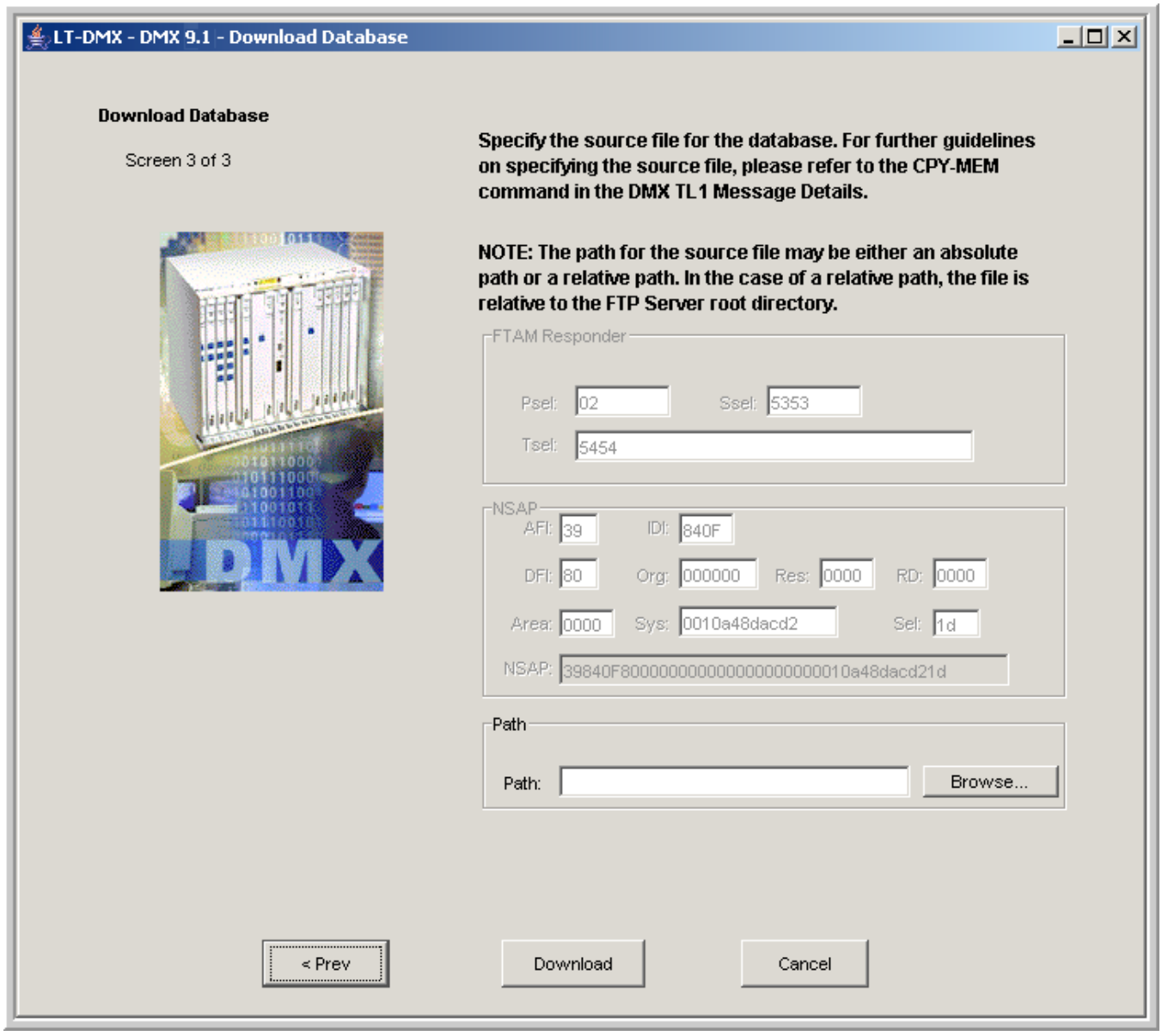
25 On Screen 1 of 3 in the Download Database Wizard, read the information, select **FTAM** and click **Next**.

Result: Screen 2 of 3 in the Download Database Wizard appears.



26 On Screen 2 of 3 in the Download Database Wizard, read the information, verify that the LAN port you are connected to has OSI Function Enable selected, and click **Next**.

Result: Screen 3 of 3 in the Download Database Wizard appears.



27 On Screen 3 of 3 in the Download Database Wizard in the **Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Step 3. For example: **`\backups\<subdirectory>\<filename>`**.

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and select the required file.

Click **Download**.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

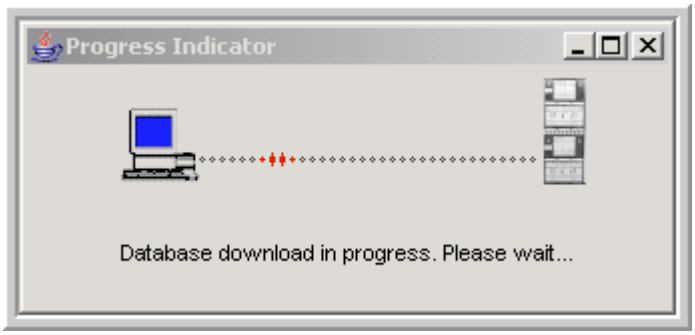
```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

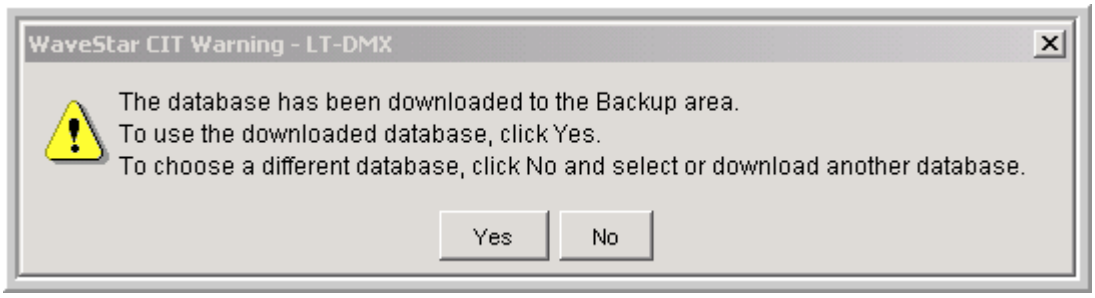
Result: A warning message appears listing the options you provisioned in the previous screens.

28 Verify the information and click **Yes**.

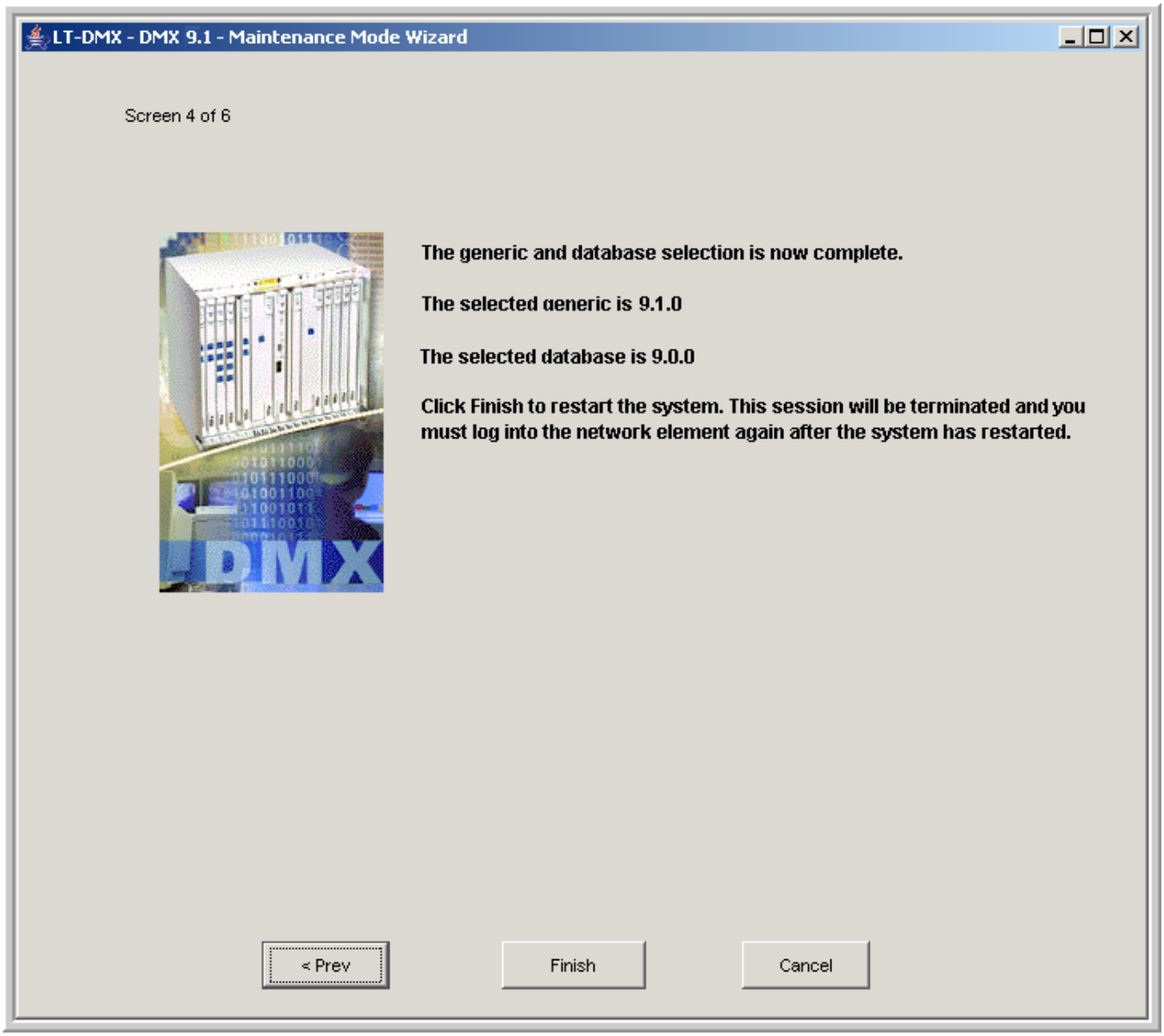
Result: If you choose Yes, the database download progress indicator runs for approximately two minutes.



29 Once the database download is complete, the following confirmation message appears. Click **Yes** to use the database that is now in the Backup area.



Result: Screen 6 of 6 in the Maintenance Mode Wizard appears. In this screen, 9.1.0 is an example; your selected generic could be different, for example 9.1.1. 5.1.3 is an example too; your selected database could be 5.1.7



30 On Screen 6 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct generic and database, and click **Finish** to restart the system and apply the generic and database.

Result: The Maintenance Mode Wizard closes and your connection to the shelf is terminated.

The LNW2 SYSCTL exhibits the following visible cycles while the generic and database are installed and validated and the SYSCTL reboots:

1. For approximately 12 minutes, the alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9, depending on your Maintenance Mode) and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
2. After approximately 12 minutes, all LEDs extinguish and the **IND** display on the SYSCTL is blank for approximately 5 seconds.
3. A flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and the **IND** display is blank for approximately 20 seconds.
4. The **ACTIVE** LED lights and remains lighted.
5. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 2.5 minutes while the database is being converted and the **IND** display is blank.
6. When nothing appears in the **IND** display and the **ACTIVE** LED is lighted and the other LEDs return to their previous state (pre-LNW1 backup), the NE software and database installation is complete.

   However, smart circuit packs can be upgrading their firmware. If flashing green **ACTIVE** LEDs are present on a circuit pack, firmware is currently being downloaded to that pack. Wait until all smart circuit packs finish upgrading their firmware before proceeding.

   If an alarm condition existed before the upgrade, the NE rediscovers the alarm condition and activate the appropriate LEDs on the shelf.
7. Continue with Step 31.

31 To verify that the upgrade was successful, depress and hold the **ACO TEST** push-button on the LNW2 SYSCTL for about 4 seconds.

Result: All LEDs on the shelf light. A red, 35-segment (5 x 7) rectangle appears in the **IND** display on the SYSCTL. Since the **IND** display is a 35-segment display, this test indicates all segments are working.

32 Release the **ACO TEST** push-button on the LNW2 SYSCTL when the red rectangle disappears in the **IND** display.

Result: The current software generic appears in the **IND** display on the LNW2 SYSCTL and the shelf LEDs return to their previous status.

33 From the Network View of the *WaveStar*® CIT session you established in Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

34 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

Your TID is your original TID, the same TID provisioned on your 5.1.xNE.

35 In the Network View, right-click the NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

36 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

37 In the NE login window, login to the shelf using your original user ID and password.

Click **OK**.

Result: The title bar of the System View and the legal notice text both reflect the current NE software generic, for example: 9.1.0.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

38 Is the Generic Software Version correct?

If...	Then...
Yes	STOP! End of Procedure.
No	Contact your next level of support.

END OF STEPS

Procedure 2-4.3: Upgrade software generic via FTAM (7.1.x, 8.0.x, 9.0.1 or later to 9.1.x)

Overview

Use this procedure to download the software generic via the File Transfer and Access Management (FTAM) protocol from the *WaveStar*® CIT to the local network element or a remote network element via DCC with OSI connectivity to the network element. To download the software generic to a local shelf via FTP, refer to Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93). To download the software generic to a remote shelf via FTTD, refer to Procedure 2-6: "Upgrade software generic via FTTD" (p. 2-130).

Important! Your NE must be running Release 7.1.x, 8.0.x, or 9.0.1 or later to use this procedure.

Required equipment

Refer to "Required equipment" (p. 2-62) in Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62).

Steps

Complete the following steps to download and upgrade system software via FTAM.

1 Before upgrading the network, perform a backup the NE database.

Reference: Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182)

2 From the System View menu, select **Configuration** → **Software** → **Download Software**.

Result: The *Download Software* window appears.

3 In the pull-down **Download From/Via:** menu, select **FTAM**.

4 In the **Source/Destination Directory Path** panel, enter the current location of the generic to be downloaded or use the **Browse** button (if available) to select the generic to be downloaded.

Important! If you selected the default installation location for the *WaveStar*® CIT and software generic: **\generics\DMX\9.1.0\p**. If necessary, replace 9.1.0 with your current release, for example 9.1.1. The *WaveStar*® CIT automatically populates the FTAM Responder and NSAP fields.

The value of the Path field can be either an absolute path or a relative path that is relative to the FTAM server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p**. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\. The syntax of the relative path must start with the path name; for example: **\generics\DMX\9.1.0\p**. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

5 In the **Product Type** panel, select the product type of the software generic that you are downloading (not necessarily the same as the NE to which you are downloading).

6 Click **OK**.

Result: A warning message appears asking you to confirm executing this command. Verify the information and click **Yes**.

While the download is in progress (approximately 30 minutes), a progress indicator window is present.

The download can be cancelled any time by pressing the **Cancel** button on the progress screen.

When the transfer is complete, the *Progress Indicator* window closes and the download software successful window appears. Click **OK**.

7 **Important!** Do NOT insert a new circuit pack in the shelf until after you apply the new software generic and clear the `dormant/exec version mismatch` condition.

Do you wish to apply (activate) the software generic that you recently downloaded to the dormant area of the Alcatel-Lucent 1665 DMX shelf?

If...	Then...
Yes	Proceed to Procedure 2-8: "Apply software generic" (p. 2-141) and then continue with Step 8.
No	Continue with Step 8.

8 Do you wish to upgrade additional shelves via FTAM?

If...	Then...
Yes	Repeat this procedure from Step 2 for each shelf that you wish to upgrade via FTAM.
No	STOP! End of Procedure.

END OF STEPS

Procedure 2-5: Upgrade software generic via FTP

Overview

Use this procedure to upgrade the software generic to Release 9.1.x via File Transfer Protocol (FTP).

Note: You can upgrade directly to 9.1.x from the following releases:

- R5.1.3/5.1.7
- R7.1.2
- R8.0.2/R8.0.3/8.0.4/8.0.5/8.0.6
- R9.0.1

You must complete a two-step upgrade to 9.1.x from the following releases:

- R6.0.1/6.0.2/6.0.4 through R8.0.5
- R7.0.2 through R8.0.5
- R7.1.1/7.1.4 through R8.0.6

You must complete a three-step upgrade to 9.1.x from R5.1.4/5.1.5 through R7.0.2, and then through R8.0.5.

To download the software generic to a local shelf via FTAM, refer to Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62).

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to "Required equipment" (p. 2-2) listed in this chapter, the following equipment is also required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port
- Copy of the new system generic software program on your PC or FTP server
- Current *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed

Important! If the FTP server fails to start, it could mean that another program using an FTP server is already running. Depending on what operating system you are using, you must go to the device file and disable the FTP server. Refer to Procedure 14-18: "Disable an FTP server on your PC" (p. 14-105) for instructions for each allowed operating system.

Before you begin

Before performing this procedure:

1. Refer to "Before you begin" (p. 2-2) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Verify that new software generic program is available.
3. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for a description of any special considerations required when installing this version of software.

Steps

Complete the following steps to upgrade the software generic via FTP.

1 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the rear **J16 IAO LAN** port on the Alcatel-Lucent 1665 DMX shelf backplane or the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port, OSI is disabled.)

Double-click the *WaveStar*® CIT icon on your desktop and login (if necessary), to start the *WaveStar*® CIT software on the PC. Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

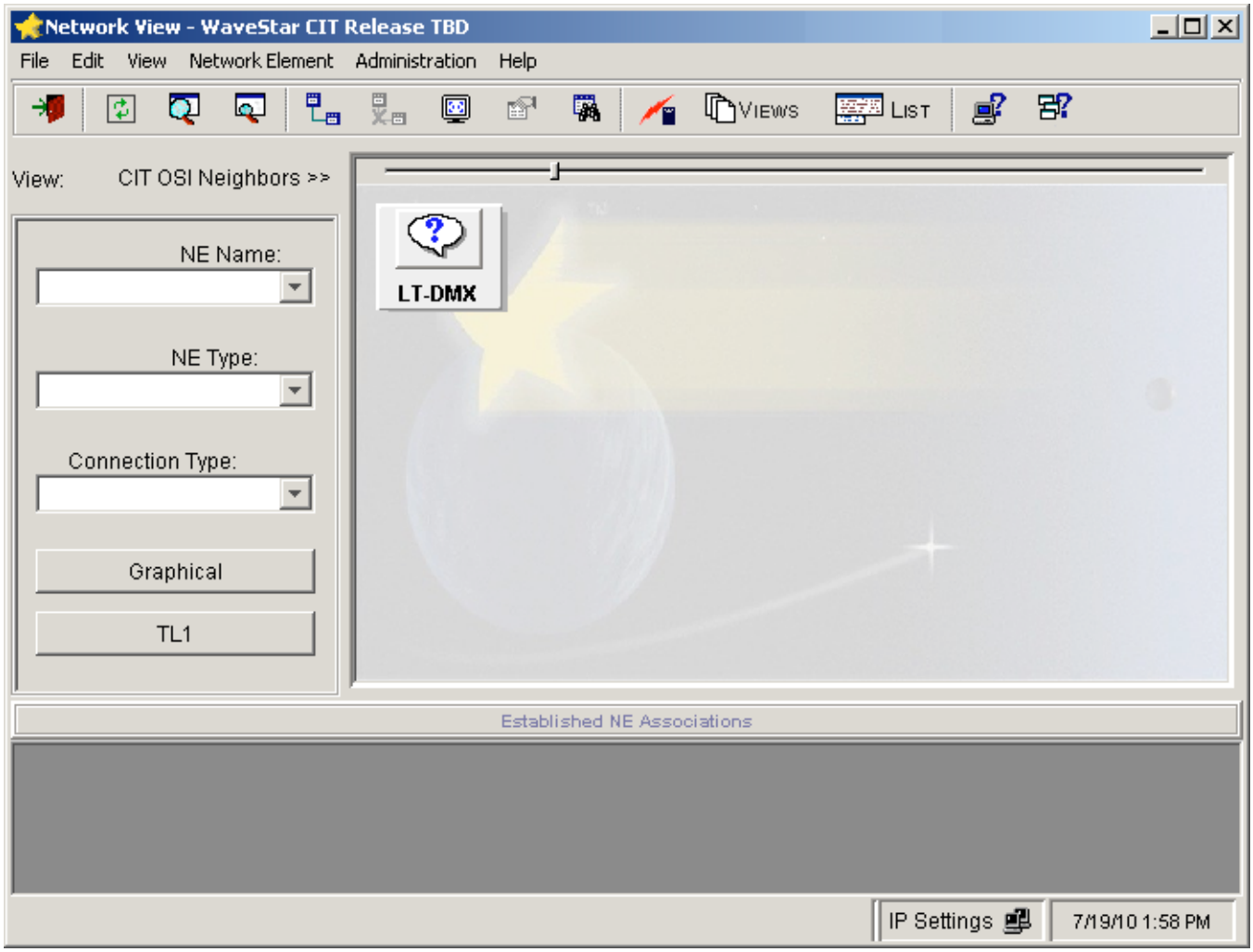
Result: The *Network View* appears.

2 From the **View:** pull-down menu, select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI neighbor(s) are automatically detected.

If you were previously logged in to the NE and/or you do not see your NE, from the Network View, select **View** → **Refresh OSI View**.



3 In the Network View, right-click the NE icon that was detected (default TID is LT-DMX, your TID can be different), and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

4 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

5 In the NE login window, login to the shelf using your user ID and password. Click **OK**.

6 From the System View menu, select **View** → **Equipment**, highlight the SYSCTL, and click **Select**.

Result: The *View Equipment* window appears. Record the Apparatus Code and the Program Version.

7 What is the apparatus code of your SYSCTL and what program version (software generic Release x.x.x) is it currently running?

If...	Then...
Apparatus Code = LNW1 Program Version = 3.1, 4.0, 5.0	You must upgrade your software to Release 5.1.3 and then repeat this procedure from Step 1.
Apparatus Code = LNW1 Program Version = 5.1.3/5.1.7	Proceed to Procedure 2-5.1: "Verify proper equipage in Main slots" (p. 2-97).
Apparatus Code = LNW1 Program Version = 5.1.4/5.1.5	You must upgrade your software to Release 7.0.2 and then repeat this procedure from Step 1.
Apparatus Code = LNW2 Program Version = 6.0.x (x=1, 2, 4) or 7.0.2	You must upgrade your software to Release 8.0.6 and then repeat this procedure from Step 1.
Apparatus Code = LNW2 Program Version = 7.1.x (x=1, 2, 4)	You must upgrade your software to Release 7.1.2 and then repeat this procedure from Step 1.
Apparatus Code = LNW2 Program Version • 7.1.x (x=1, 2, 4) • 8.0.x (x=2, 4, 5, 6) • 9.0.1	Proceed to Procedure 2-5.3: "Upgrade software generic via FTP (7.1.x, 8.0.x, 9.0.1 or later to 9.1.x)" (p. 2-125).

END OF STEPS

Procedure 2-5.1: Verify proper equipage in Main slots

Overview

Use this procedure to verify that the Main slots are equipped with circuit packs that are supported in 9.1.x.

LNW26 circuit packs are not supported in 9.1.x.

Since LNW26B-type circuit packs with the jumper set to *NORMAL* are identical to LNW26 circuit packs, LNW26B-type circuit packs (LNW26B, LNW28, LNW77, LNW121B-151B) with the circuit pack mode jumper set to *NORMAL* (six STS-1 switch fabric) are not supported in 9.1.x. The jumper on LNW26B-type circuit packs must be set to *ENHANCED* (12 STS-1 switch fabric) to use these circuit packs in 9.1.x.

Important! If you determine that the Main slots in your NE are equipped with unsupported circuit packs, you must upgrade those circuit packs before upgrading to 9.1.x.

Required equipment

Refer to "Required equipment" (p. 2-93) in Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure:

1. Complete Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93).
2. If your Main slots contain unsupported circuit packs, you must have access to supported circuit packs.

Steps

Complete the following steps to verify that supported equipment is installed in your shelf.

1 From the System View menu, select **Reports** → **Equipment Lists** → **Pack**, highlight **Shelf**, and click **Select**.

Result: The *Circuit Pack List* screen appears.

2 In the *Circuit Pack List* screen, locate the *main-1-cp* and *main-2-cp* AIDs in the Circuit Pack AID column. Are the Apparatus Codes for those AIDs either LNW26 or LNW26B-type (LNW26B, LNW28, LNW77, LNW121B-151B)?

If...	Then...
Yes (LNW26)	You must upgrade the LNW26 circuit packs in the Main slots to supported circuit packs. Proceed to Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5) and then repeat this procedure.
Yes (LNW26B, LNW28, LNW77, LNW121B-151B)	Continue with Step 3 to determine the circuit pack mode of the packs.
No	The Main slots are equipped with circuit packs that are compatible with 9.1.x. Proceed to Procedure 2-5.2: "Upgrade software generic via FTP (5.1.3/5.1.7 to 9.1.x)" (p. 2-100).

3 From the System View menu, select **View** → **Equipment** → **Circuit Pack**, highlight CP main-1, and click **Select**.

Result: The *View Equipment* screen appears.

4 In the *View Equipment* screen, locate the Circuit Pack Mode parameter in the Equipment Details panel. Note the value of the Circuit Pack Mode for CP Main-1, either *NORMAL, or ENHANCED*.

Do NOT click **Close** on the *View Equipment* screen.

5 Highlight CP main-2 and click **Select**.

6 In the *View Equipment* screen, locate the Circuit Pack Mode parameter in the Equipment Details panel. Note the value of the Circuit Pack Mode for CP Main-2, either *NORMAL, or ENHANCED*.

7 Refer to Step 4 and Step 6. Is the Circuit Pack Mode for CP main-1 and/or CP main-2 *NORMAL* (six STS-1 switch fabric)?

If...	Then...
Yes	The LNW26B-type circuit packs with the Circuit Pack Mode jumper set as *NORMAL* are NOT supported in 9.1.x. Choose one of the following two options: 1. Change Circuit Pack Mode to *ENHANCED* by physically changing the jumper setting on the circuit packs. Proceed to Procedure 4-22: "Change circuit pack mode of LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs" (p. 4-113) and then repeat this procedure. 2. Upgrade the LNW26B-type circuit packs to LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs. These circuit packs can cross-connect VT1.5 signals in up to 48 STS-1 signals. Refer to Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5) and then repeat this procedure.
No	The LNW26B-type circuit packs with the Circuit Pack Mode jumper set as *ENHANCED* are supported in 9.1.x. Proceed to Procedure 2-5.2: "Upgrade software generic via FTP (5.1.3/5.1.7 to 9.1.x)" (p. 2-100) to upgrade the 5.1.x shelf to 9.1.x.

END OF STEPS

Procedure 2-5.2: Upgrade software generic via FTP (5.1.3/5.1.7 to 9.1.x)

Overview

Use this procedure to upgrade a software generic from Release 5.1.3/5.1.7 to Release 9.1.x via FTP.

Required equipment

Refer to "Required equipment" (p. 2-93) in Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure:

1. Complete Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93).
2. You must be able to perform a backup of the LNW1 database.

Steps

Complete the following steps to upgrade a software generic from Release 5.1.3/5.1.7 or later to Release 9.1.x via FTP.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **FTP**.

3 Select the connection from the **Profile** pull-down menu and proceed to Step 5. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

4 If you entered connection information in Step 3 and wish to keep the information for future backups:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

5 In the **Source/Destination Directory Path** field, enter **\backups\<filename>** if you wish to save the backup file to the default location. (If the *WaveStar*® CIT is the FTP server, a maximum of 80 characters is suggested for this field.)

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

6 Click **OK**.

You are asked to verify that you wish to backup to the directory that you entered. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears, indicating that the backup is in progress. When the backup completes, a `Remote Backup successful` screen appears. Click **OK**. The backup file is now stored. If the default path and a subdirectory were used, the file can be found at:

`C:/Program Files/Alcatel-Lucent/WaveStar CIT/backups/<subdirectory>/<filename>`

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

7 Close your *WaveStar*® CIT session with the 5.1.x NE. From the System View, select **File** → **NE Disconnect** and click **Yes** in the confirmation window.

Result: The *System View* closes.

8 Disconnect the LAN and/or serial cables from the **LAN** and/or **RS232** port(s) on the front of the LNW1 SYSCTL.

9 Initiate a ten-second countdown (9, 8, 7, 6, 5, 4, 3, 2, 1, 0) in the **IND** display on the LNW1 SYSCTL by simultaneously depressing the **ACO TEST** and **SEL** buttons on the front of the LNW1 SYSCTL.

Important! Removing the LNW1 without initiating the ten-second countdown can result in unexpected and undesirable protection switches, incorrect circuit fault indications, or incoming signal failure alarms. All SYSCTL functions are suspended during the countdown.

10 Remove the LNW1 SYSCTL circuit pack during the 10-second countdown.

Important! While the SYSCTL circuit pack is removed, do *NOT* remove or replace any transmission circuit packs.

11 **Important!** For software installation, ensure that two NVMs are present in the LNW2 SYSCTL. After the LNW2 is installed, if one or two NVMs are missing, `NVM removed` alarm(s) are issued. If both NVM sockets are empty, the **IND** displays an alternating **E** and **0** and **1**.

Refer to Step 12 for the complete listing of codes and required actions.

Seat the new LNW2 SYSCTL circuit pack and allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 10 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and the **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.
4. Continue with Step 12.

12 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
alternating **M** and **P** and **6** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **7** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **7** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **1**	7.1 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **8** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **9** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **9** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **1**	9.1 Maintenance Mode. Continue with Step 13.
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.

If...	Then...
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent-supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **1** and **0**	LNW2 SYSCTL does not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.
alternating **N** and **O** and **x**	"x" indicates that the NVM socket (1 or 2) is empty or the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
Letter **U**	LNW2 SYSCTL does not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.

If...	Then...
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

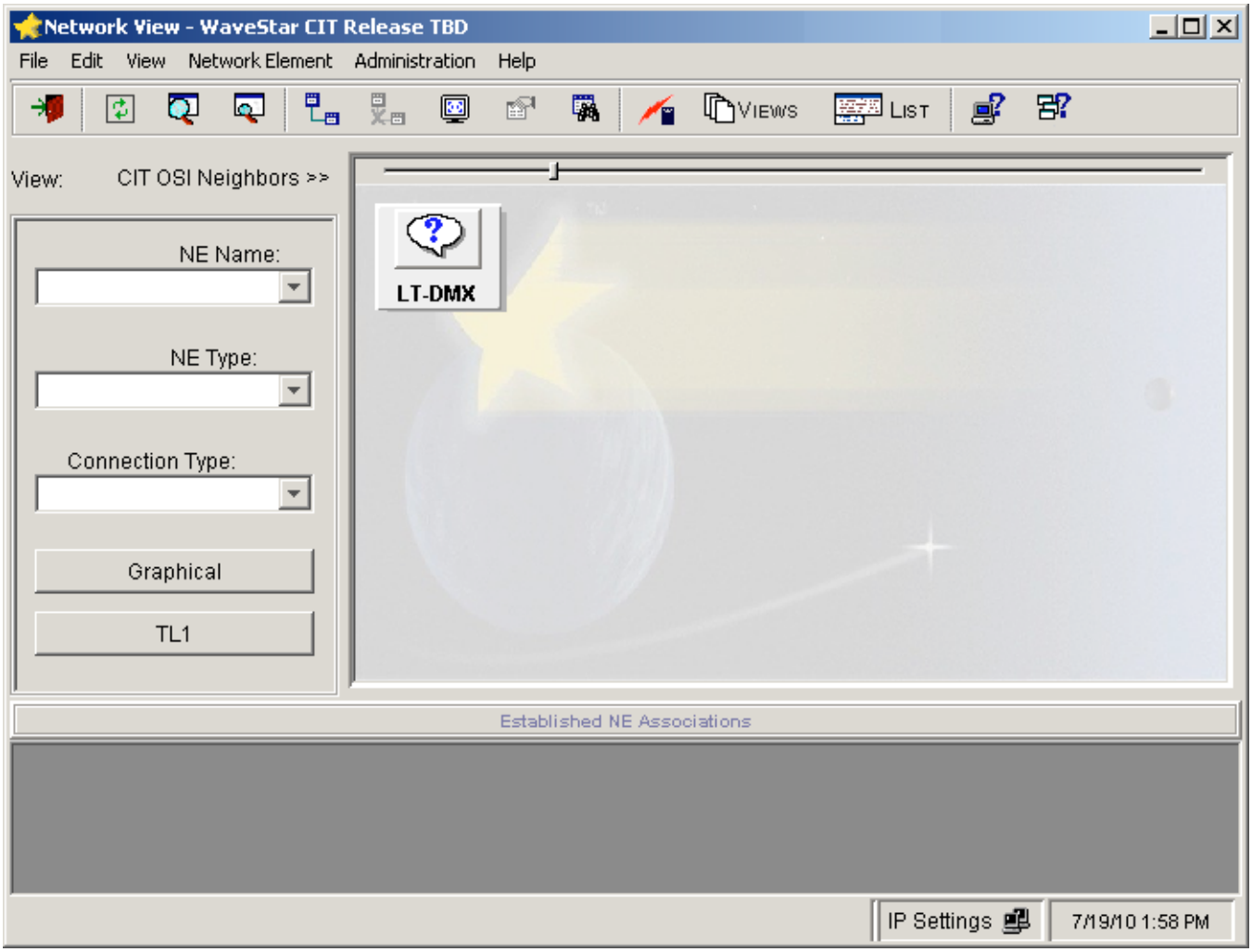
13 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the rear **J16 IAO LAN** port on the Alcatel-Lucent 1665 DMX shelf backplane or the front **LAN** port on the LNW2 SYSCTL circuit pack faceplate. (When TCP/IP is enabled on the rear LAN port, OSI is disabled.)

14 From the Network View of the *WaveStar*® CIT session you established in Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI Neighbor(s) are automatically detected.

If you were previously logged in to the NE and/or you do not see your NE, from the Network View, select **View** → **Refresh OSI View**.



15 In the Network View, right-click the LT-DMX NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

16 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

17 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

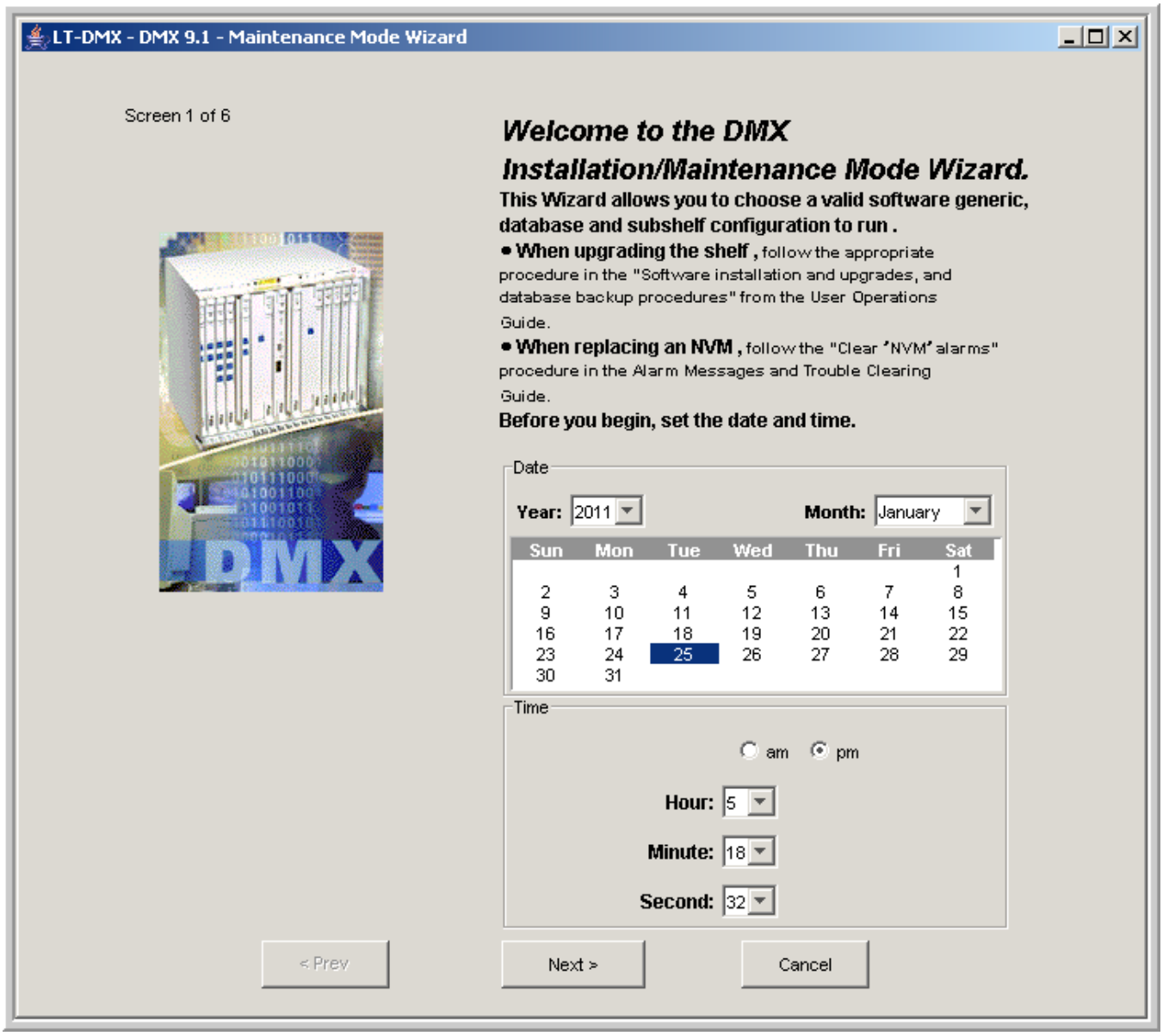
Password: ***DMX2.5G10G***

Click **OK**.

Important! After you select your backup database, complete the Maintenance Mode Wizard, and the NE restarts, your original User IDs and Passwords are restored.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 12), the title bar of the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0, DMX 9.0, or DMX 9.1



This screen picks up the time format preference from the *WaveStar*® CIT.

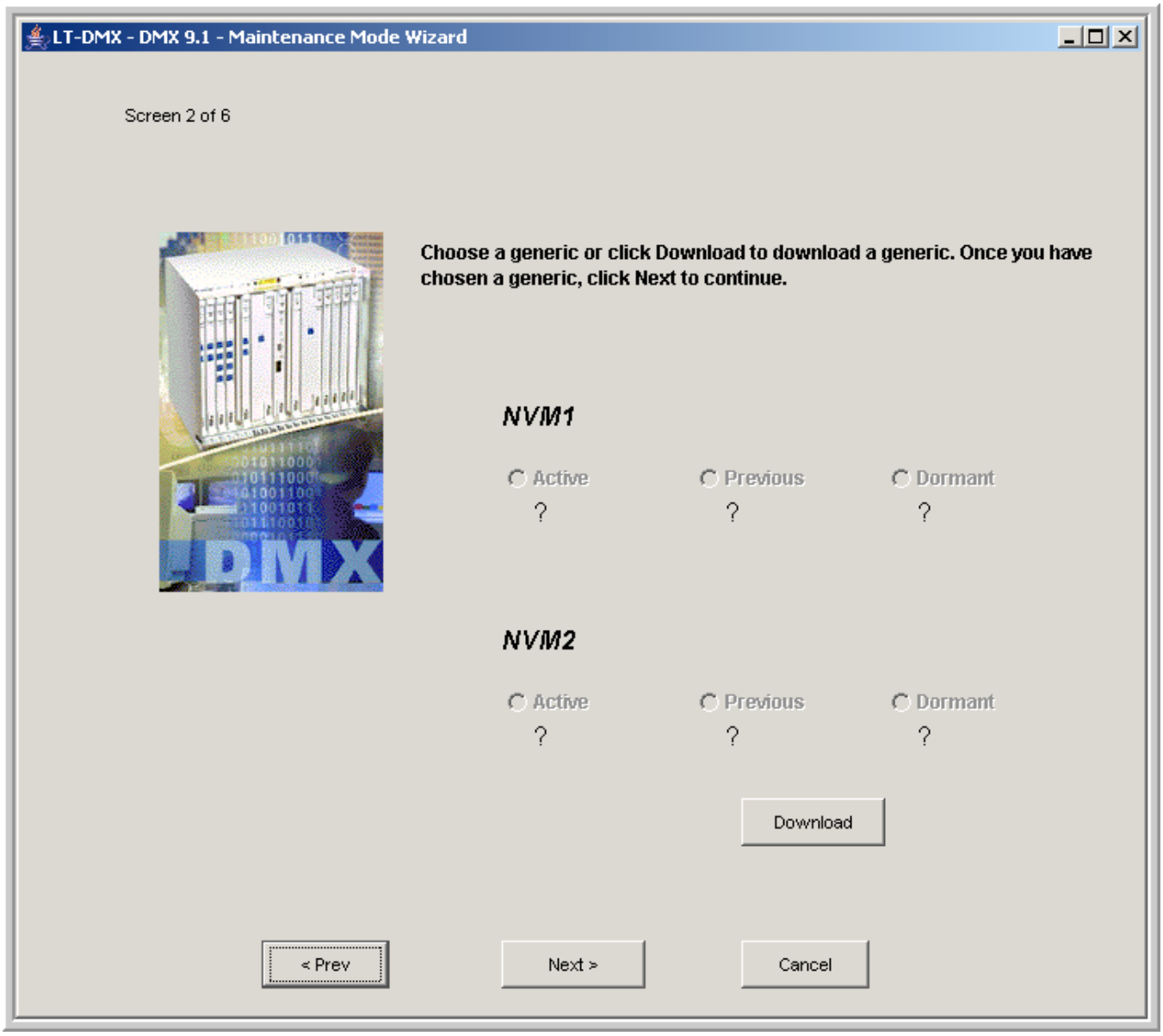
You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

18 **Important!** The actual time and date are preset from your PC.

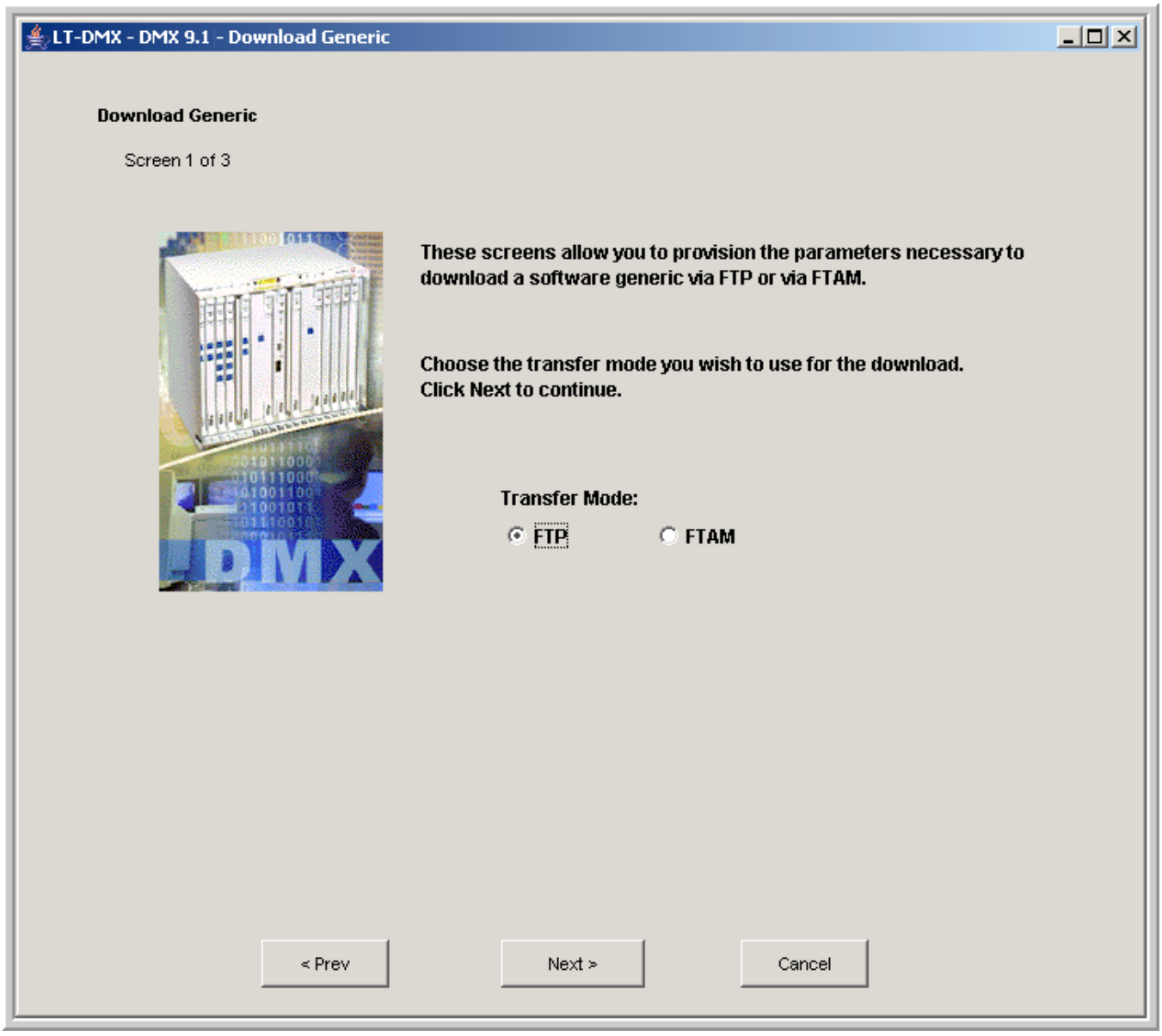
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



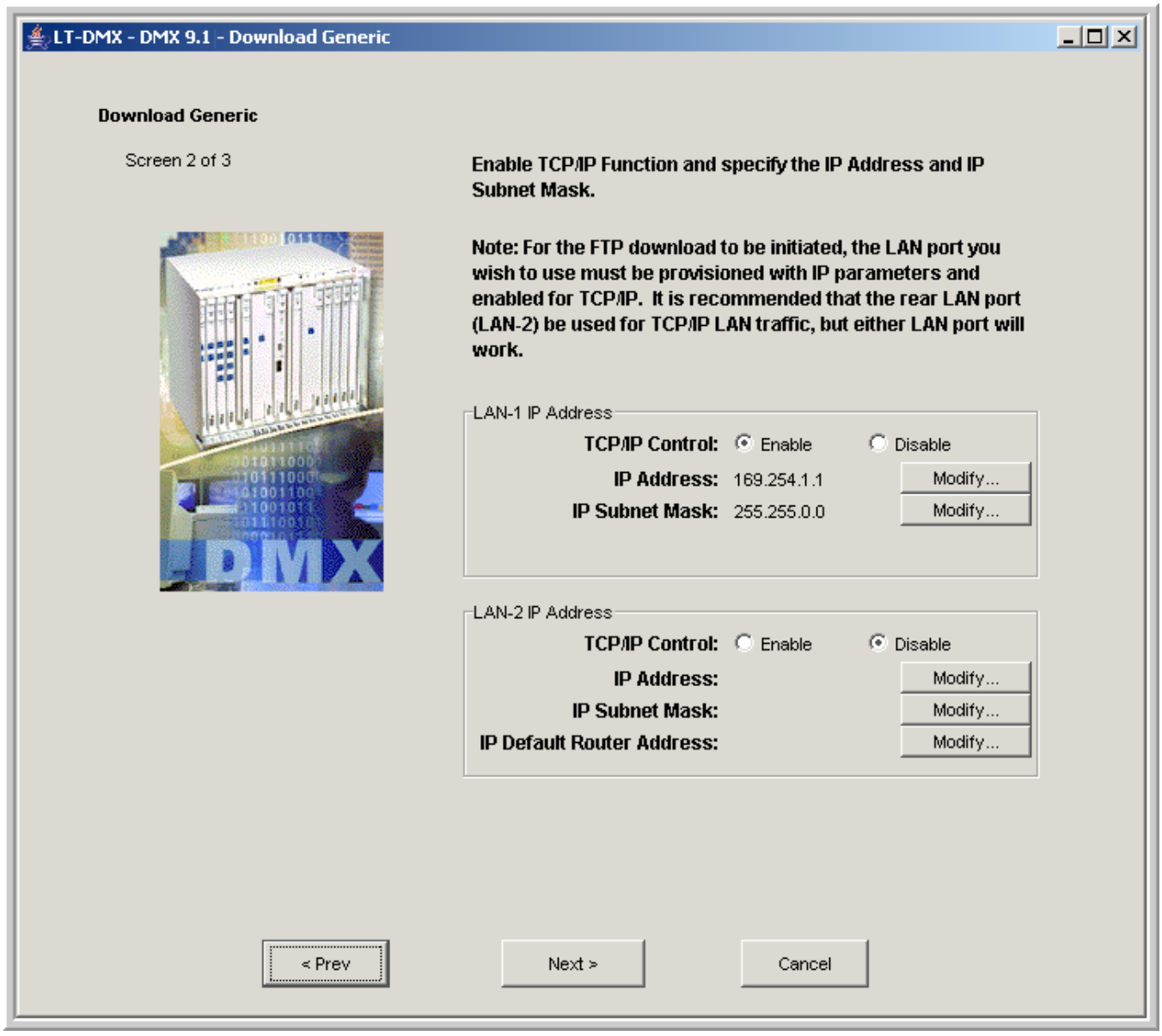
19 On Screen 2 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Generic Wizard appears.



20 On Screen 1 of 3 in the Download Generic Wizard, read the information, select **FTP** and click **Next**.

Result: Screen 2 of 3 in the Download Generic Wizard appears.

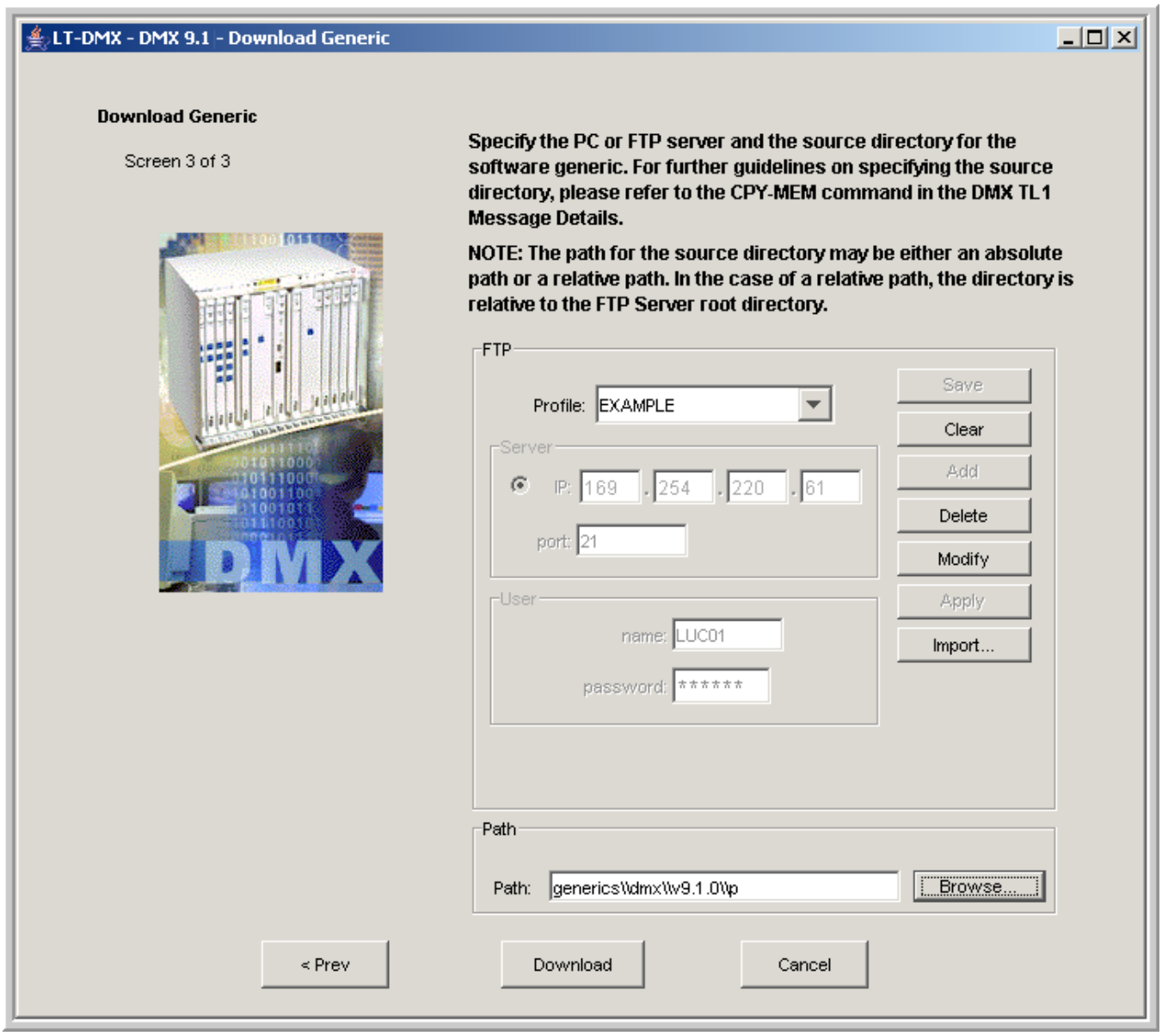


21 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

If the boot code of your LNW2 (Step 12) was 7.1 or later, you may see the IP Address and IP Subnet Mask field populated with the defaults illustrated in Screen 2 of 3. Changing anything on this screen will cause the shelf to reset.

If required, follow the instructions to enable TCP/IP Control on the LAN port to which you are connected. Click **Modify** to enter the IP Address, IP Subnet Mask, and/or IP Default Router Address. Click **Next**.

Result: Screen 3 of 3 in the Download Generic Wizard appears.



22 Select the connection from the **Profile** pull-down menu and proceed to Step 24. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

23 If you entered connection information in Step 22 and wish to keep the information for future FTP activities:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Important! Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

24 On Screen 3 of 3 in the Download Generic Wizard in the **Path** panel, enter the current location of the generic to be downloaded in the Path field or use the **Browse** button to select the generic to be downloaded. (If the FTP server is not the local host, the **Browse** button is greyed out.) Click **Download**.

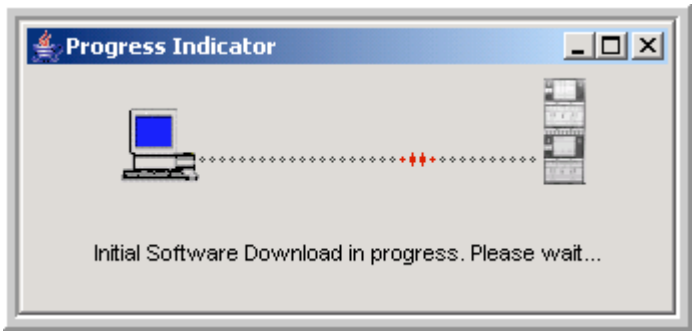
The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: `C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.The syntax of the relative path must start with the path name; for example: **`\generics\DMX\9.1.0\p`**. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

If the FTP server is not the *WaveStar*® CIT, then enter the path starting at the FTP home directory on the server.

Result: A warning message appears listing the options you provisioned in the previous screens.

25 Verify the information and either click **Yes** to start the download process or click **No** to return to the download screen and change your selections.

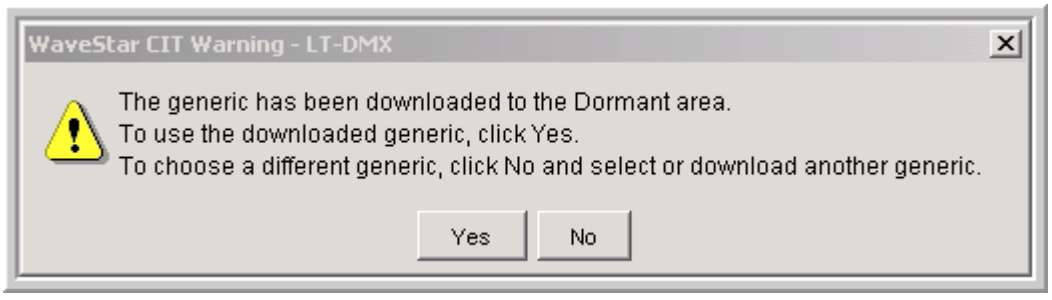
Result: If you choose yes, the following initial software download progress indicator runs for approximately 30 minutes.



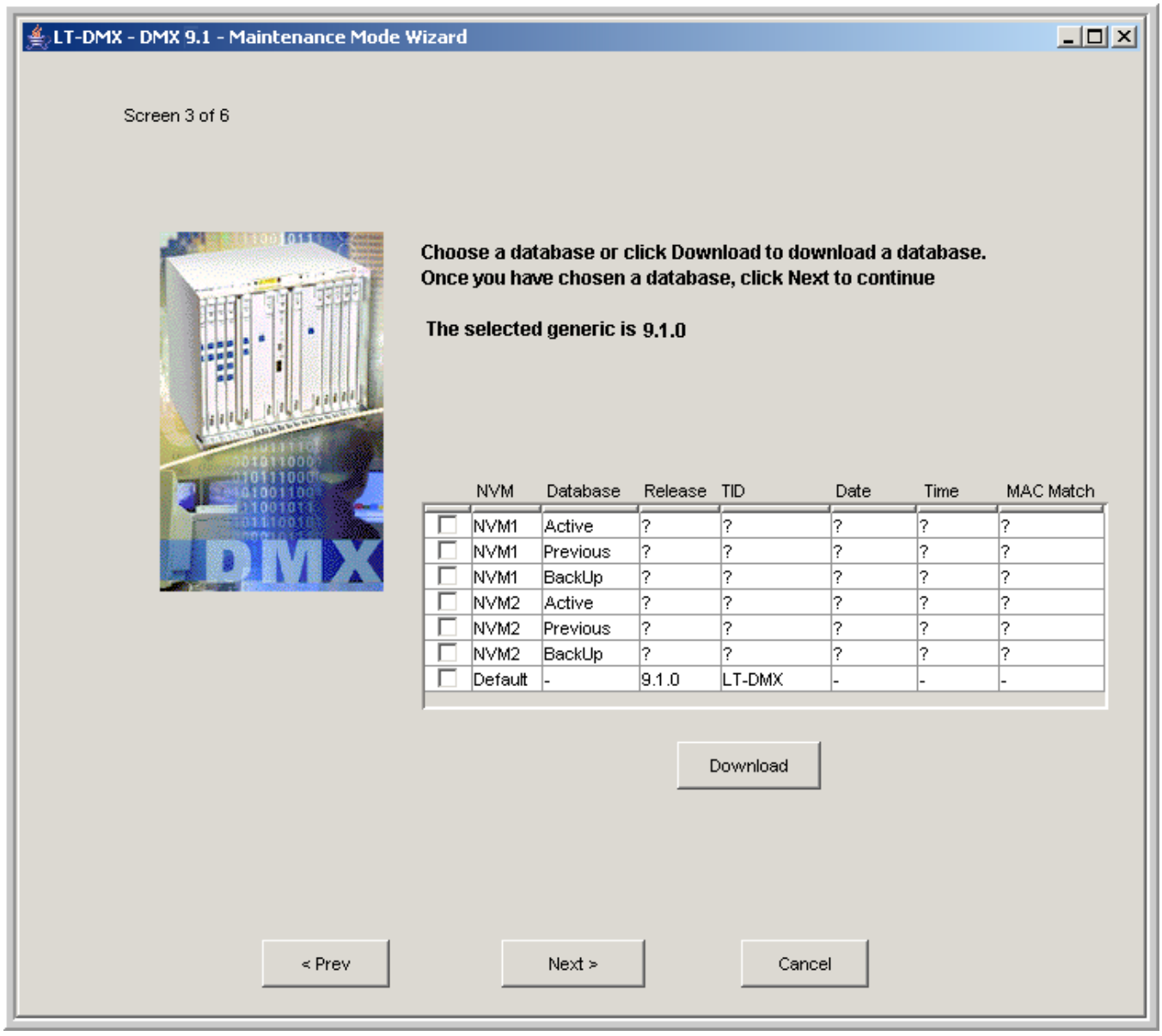
26 Do you wish to observe the FTP download progress?

If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 27.
No	Continue with Step 27.

27 Once the software generic download is complete, the following confirmation message appears. Click **Yes** to use the generic that is now in the Dormant area.



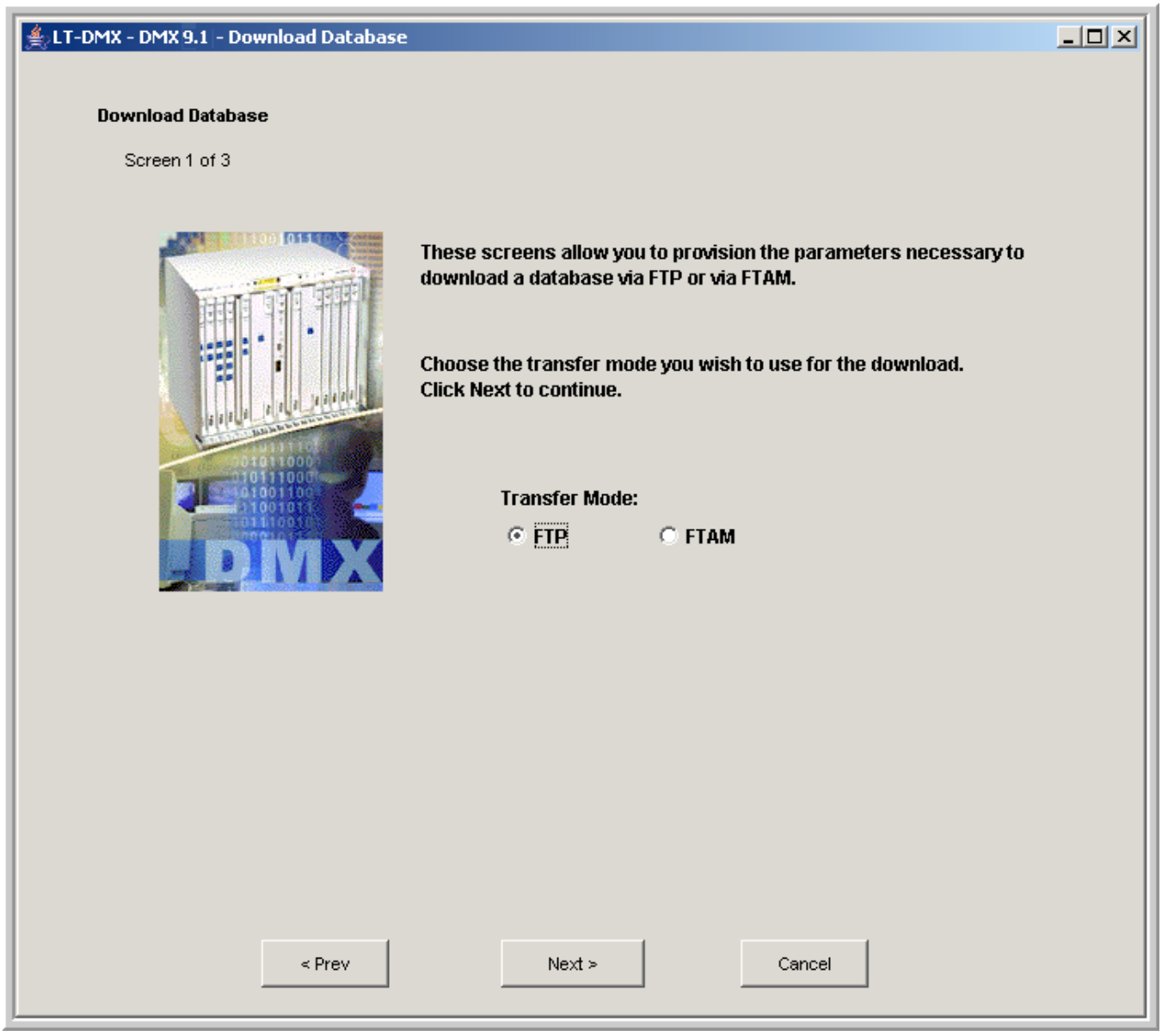
Result: Screen 3 of 6 in the Maintenance Mode Wizard appears.



28 **Important!** Do NOT select the default database or you could loose service to your shelf. You MUST download your previously backed up database.

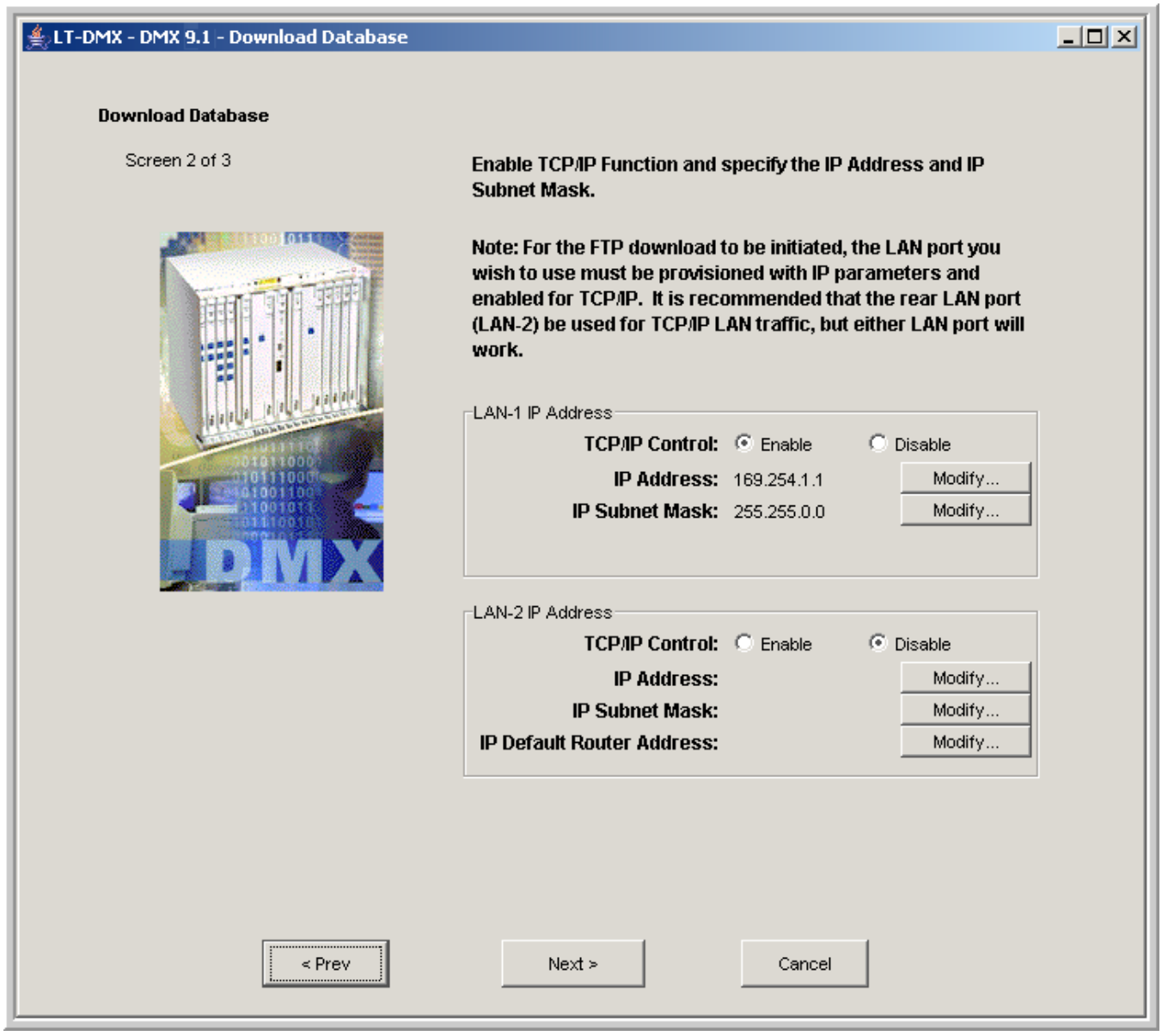
On Screen 3 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Database Wizard appears.



29 On Screen 1 of 3 in the Download Database Wizard, read the information, select **FTP** and click **Next**.

Result: Screen 2 of 3 in the Download Database Wizard appears.

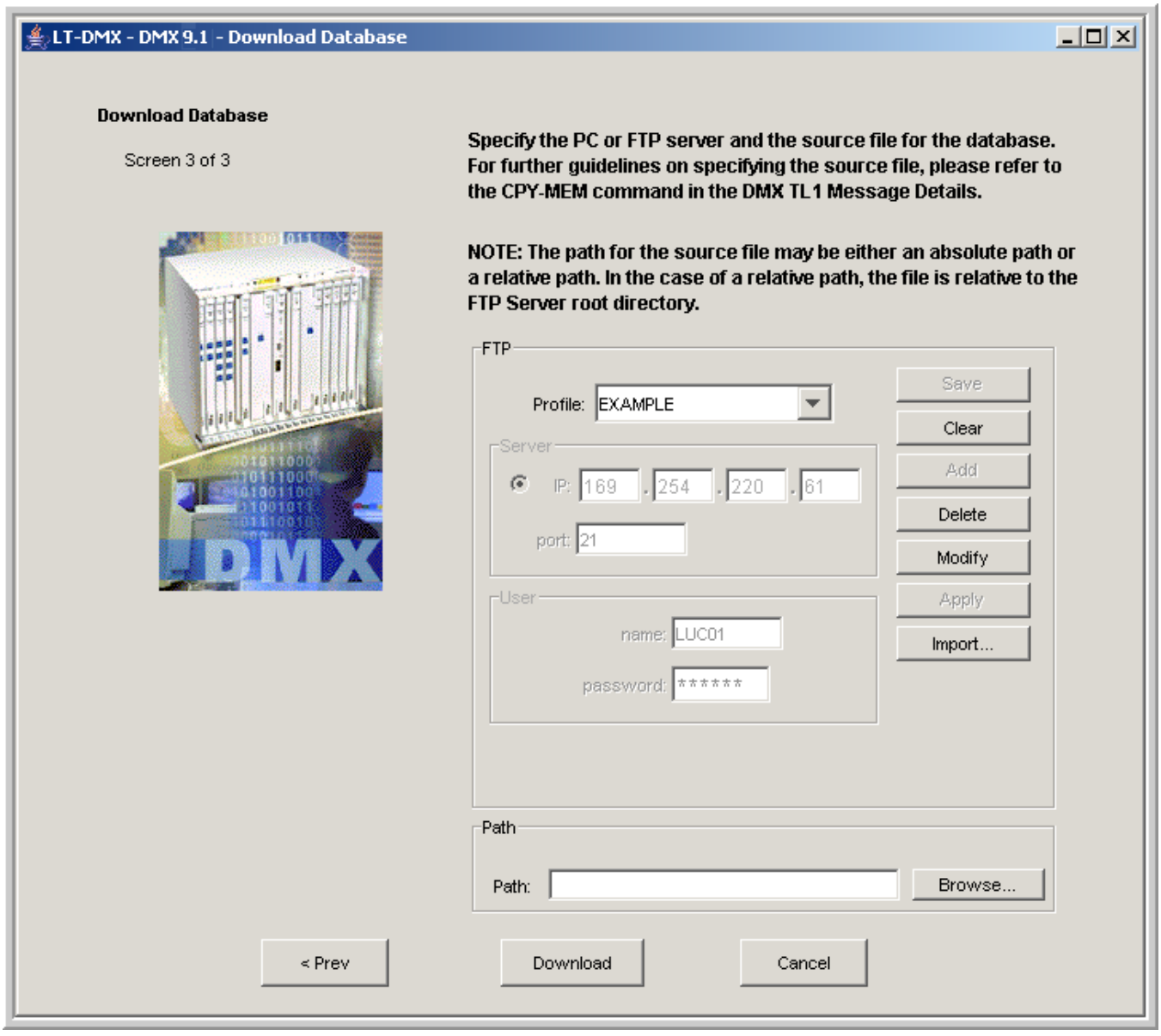


30 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

On Screen 2 of 3 in the Download Database Wizard, the information entered in Step 21 is still present and valid. If the information is not present, follow the instructions to enable TCP/IP Control on the LAN port to which you are connected. Click **Modify** to enter the IP Address, IP Subnet Mask, and/or IP Default Router Address.

Click **Next**.

Result: Screen 3 of 3 in the Download Database Wizard appears.



31 Select the connection from the **Profile** pull-down menu and proceed to Step 33. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

32 If you entered connection information in Step 31 and wish to keep the information for future FTP activities:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Important! Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

33 On Screen 3 of 3 in the Download Database Wizard in the **Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Step 5. For example: **`\backups\<subdirectory>\<filename>`**.

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Click **Download**.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

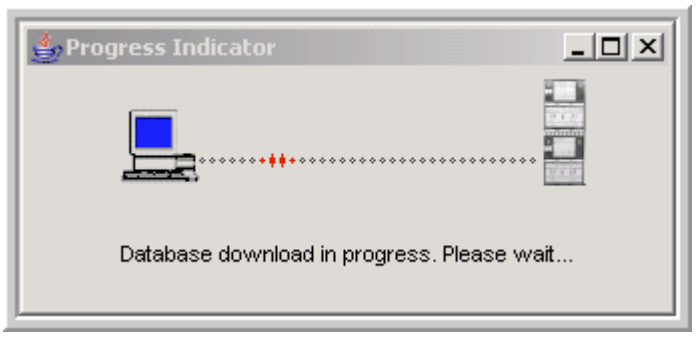
```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

Result: A warning message appears listing the options you provisioned in the previous screens.

34 Verify the information and click **Yes**.

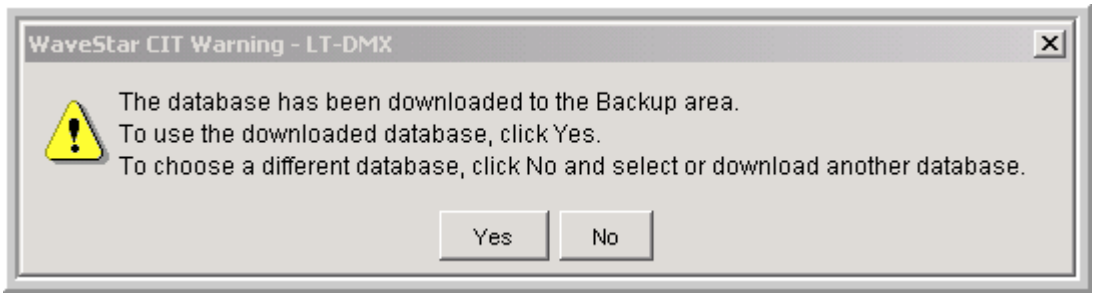
Result: If you choose Yes, the database download progress indicator runs for approximately two minutes.



35 Do you wish to observe the FTP download progress?

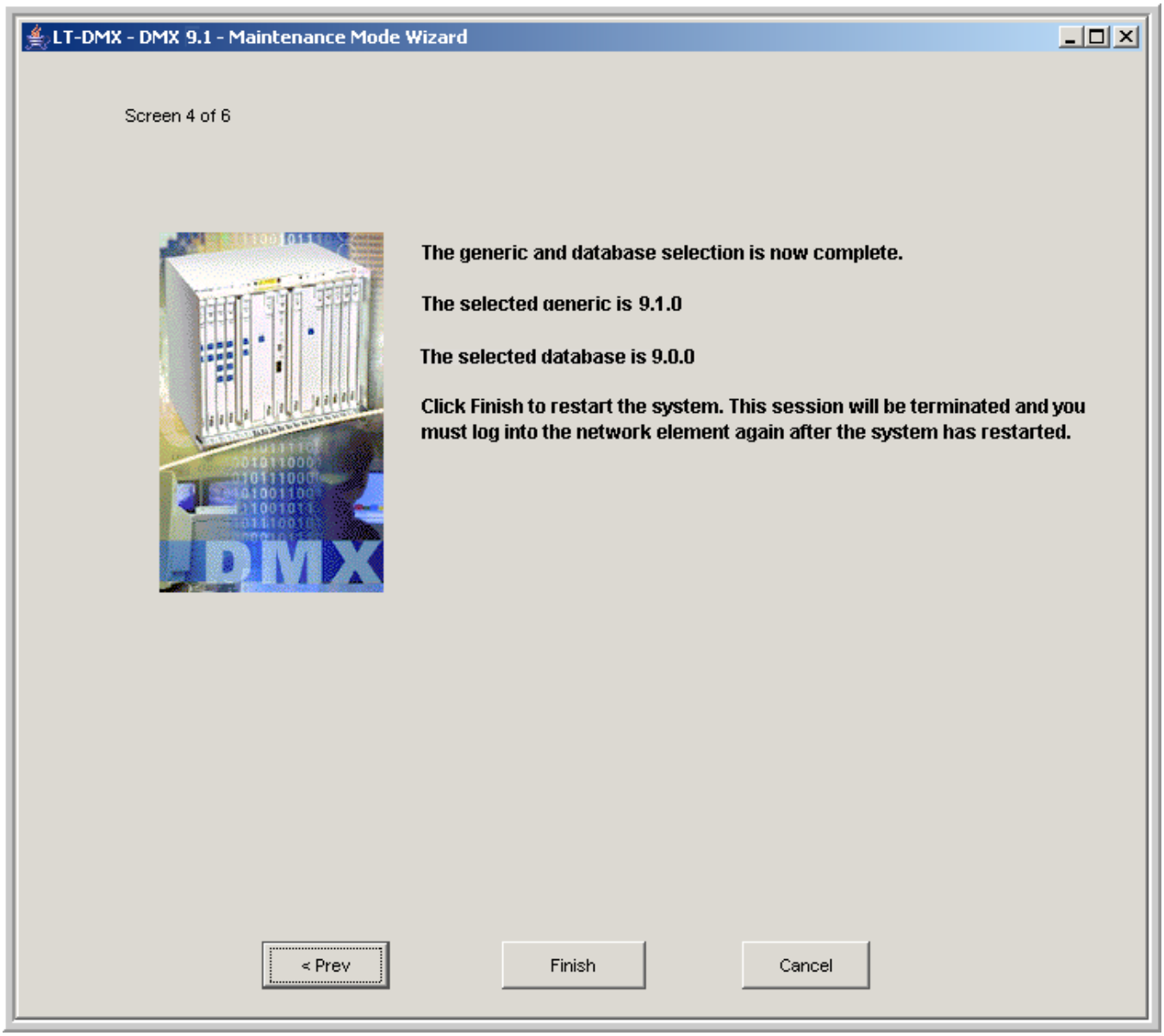
If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 36.
No	Continue with Step 36.

36 Once the database download is complete, the following confirmation message appears. Click **Yes** to use the database that is now in the Backup area.



Result: Screen 6 of 6 in the Maintenance Mode Wizard appears. In this screen, 9.1.0 is an example; your selected generic could be different, for example 9.1.1.

5.1.3 is an example too; your selected database could be 5.1.x.



37 On Screen 6 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct generic and database, and click **Finish** to restart the system and apply the generic and database.

Result: The Maintenance Mode Wizard closes and your connection to the shelf is terminated.

The LNW2 SYSCTL exhibits the following visible cycles while the generic and database are installed and validated and the SYSCTL reboots:

1. For approximately 12 minutes, the alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9, depending on your Maintenance Mode) and "**.**" (“.” is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
2. After approximately 12 minutes, all LEDs extinguish and the **IND** display on the SYSCTL is blank for approximately 5 seconds.
3. A flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and the **IND** display is blank for approximately 20 seconds.
4. The **ACTIVE** LED lights and remains lighted.
5. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 2.5 minutes while the database is being converted and the **IND** display is blank.
6. When nothing appears in the **IND** display and the **ACTIVE** LED is lighted and the other LEDs return to their previous state (pre-LNW1 backup), the NE software and database installation is complete.

   However, smart circuit packs can be upgrading their firmware. If flashing green **ACTIVE** LEDs are present on a circuit pack, firmware is currently being downloaded to that pack. Wait until all smart circuit packs finish upgrading their firmware before proceeding.

   If an alarm condition existed before the upgrade, the NE rediscovers the alarm condition and activates the appropriate LEDs on the shelf.
7. Continue with Step 38.

38 To verify that the upgrade was successful, depress and hold the **ACO TEST** push-button on the LNW2 SYSCTL for about 4 seconds.

Result: All LEDs on the shelf light. A red, 35-segment (5 x 7) rectangle appears in the **IND** display on the SYSCTL. Since the **IND** display is a 35-segment display, this test indicates all segments are working.

39 Release the **ACO TEST** push-button on the LNW2 SYSCTL when the red rectangle disappears in the **IND** display.

Result: The current software generic appears in the **IND** display on the LNW2 SYSCTL and the shelf LEDs return to their previous status.

40 From the Network View of the *WaveStar*® CIT session you established in Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

41 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

Your TID is your original TID, the same TID provisioned on your 5.1.x NE.

42 In the Network View, right-click the NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

43 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

44 In the NE login window, login to the shelf using your original user ID and password; the same user ID and password provisioned on your 5.1.x NE.

Click **OK**.

Result: The title bar of the System View and the legal notice text both reflect the current NE software generic, for example: 9.1.0.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

45 Is the Generic Software Version correct?

If...	Then...
Yes	STOP! End of Procedure.
No	Contact your next level of support.

END OF STEPS

Procedure 2-5.3: Upgrade software generic via FTP (7.1.x, 8.0.x, 9.0.1 or later to 9.1.x)

Overview

Use this procedure to download the software generic via the FTP from the *WaveStar*® CIT to the local network element. To download the software generic to a local shelf via FTP, refer to Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93). To download the software generic to a remote shelf via FTTD, refer to Procedure 2-6: "Upgrade software generic via FTTD" (p. 2-130).

Important! Your NE must be running Release 7.1.x, 8.0.x, or 9.0.1 or later to use this procedure.

Required equipment

Refer to "Required equipment" (p. 2-93) in Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93).

Steps

Complete the following steps to download and upgrade system software via FTP.

1 Before upgrading the network, perform a backup the NE database.

Reference: Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155)

2 From the System View menu, select **Administration** → **View NE Administration**. Verify that *File Transfer Protocol (FTP)* is Enabled and click **Close**.

3 If necessary, select **Administration** → **Set NE** and enable **File Transfer Protocol**. Click **OK**.

4 Provision the destination shelf for TCP/IP communications. From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window appears.

5 Which port are you provisioning for TCP/IP?

If...	Then...
LAN-1 for the front **LAN** port on the SYSCTL (LAN-1 is intended to be used for local [direct] software downloads.)	Continue with Step 6.
LAN-2 for the rear **J16 IAO LAN** port on the backplane	Proceed to Step 7.

6 From the *Data Communications* window, click the **TCP/IP** tab and provision the following fields accordingly for LAN-1:

1. **Port AID:** select the port that you are using for FTP: LAN-1
2. **TCP/IP Function:** select Enable
3. Click **Modify** to either enter or change the following:
   - IP Address
   - IP Subnet Mask
   - IP Default Router Address (Because LAN-1 is intended to be used for local [direct] software downloads, the IP Default Router Address is not required when using LAN-1).
4. Proceed to Step 8.

7 From the *Data Communications* window, click the **TCP/IP** tab and provision the following fields accordingly for LAN-2:

1. **Port AID:** select the port that you are using for FTP: LAN-2
2. **TCP/IP Function:** select Enable
3. Click **Modify** to either enter or change the following:
   - IP Address
   - IP Subnet Mask
   - IP Default Router Address

8 Click **Apply**.

Important! If the TCP/IP information for one of the LAN ports is already provisioned, then reprovisioning that port, or provisioning the other LAN port can cause the shelf to reset.

Result: A warning message appears.

9 Click **Yes** and then click **Close** on the *Data Communications* window.

10 Specifying either OSI or Serial in the **Connection Type:** field, log in to the destination shelf again.

11 From the System View menu, select **Configuration** → **Software** → **Download Software**.

Result: The *Download Software* window appears.

12 In the pull-down **Download From/Via:** menu, select **FTP**. Select the connection from the **Profile** pull-down menu and proceed to Step 14. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

13 If you entered connection information in Step 12 and wish to keep the information for future FTP activities:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

Important! Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

14 In the **Source/Destination Directory Path** panel, enter the current location of the generic to be downloaded or use the **Browse** button (if available) to select the generic to be downloaded. If the FTP server is either undefined or not the local host, the **Browse** button is greyed out.

Important! If you selected the default installation location for the *WaveStar*® CIT and software generic: **\generics\DMX\9.1.0\p**. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

The value of the Path field can be either an absolute path or a relative path that is relative to the root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: `C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\. If necessary, replace 9.1.0 with your current release, for example 9.1.1.The syntax of the relative path must start with the path name; for example: **\generics\DMX\9.1.0\p**. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

15 In the **Product Type** panel, select the product type of the software generic that you are downloading (not necessarily the same as the NE to which you are downloading).

16 Click **OK**.

Result: A warning message appears asking you to confirm executing this command. Verify the information and click **Yes**. While the download is in progress, a progress indicator window is present.

The download takes approximately 30 minutes.

The download can be cancelled any time by pressing the **Cancel** button on the progress screen.

When the transfer is complete, the *Progress Indicator* window closes and the download software successful window appears. Click **OK**.

17 Is the *WaveStar*® CIT your FTP server and do you wish to observe the FTP download progress?

If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 18.

If...	Then...
No	Continue with Step 18.

18 **Important!** Do NOT insert a new circuit pack in the shelf until after you apply the new software generic and clear the `dormant/exec version mismatch` condition.

Do you wish to apply (activate) the software generic that you recently downloaded to the dormant area of the Alcatel-Lucent 1665 DMX shelf?

If...	Then...
Yes	Proceed to Procedure 2-8: "Apply software generic" (p. 2-141) and then continue with Step 19.
No	Continue with Step 19.

19 Do you wish to upgrade additional shelves via FTP?

If...	Then...
Yes	Repeat this procedure from Step 2 for each shelf that you wish to upgrade via FTP.
No	STOP! End of Procedure.

END OF STEPS

Procedure 2-6: Upgrade software generic via FTTD

Overview

Use this procedure to download the software generic to a shelf without TCP/IP connectivity via FTTD (FTAM-FTP gateway).

Note: You can upgrade directly to 9.1.x from the following releases:

- R5.1.3/5.1.7
- R7.1.2
- R8.0.2/R8.0.3/8.0.4/8.0.5/8.0.6
- R9.0.1

You must complete a two-step upgrade to 9.1.x from the following releases:

- R6.0.1/6.0.2/6.0.4 through R8.0.5
- R7.0.2 through R8.0.5
- R7.1.1/7.1.4 through R8.0.6

You must complete a three-step upgrade to 9.1.x from R5.1.4/5.1.5 through R7.0.2, and then through R8.0.5.

To download the software generic to a local shelf using SFTP, refer to Procedure 2-3: “Ugrade software generic via SFTP” (p. 2-58).

To download the software generic to a local or remote shelf via FTAM, refer to Procedure 2-4: “Upgrade software generic via FTAM” (p. 2-62).

To download the software generic to a local shelf via FTP, refer to Procedure 2-5: “Upgrade software generic via FTP” (p. 2-93).

Important! Your NE must be running Release 7.0.2, 7.1.x, 8.0.x, or 9.0.1 to use this procedure.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to “Required equipment” (p. 2-2) listed in this chapter, the following equipment is also required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port
- Copy of the new system generic software program on your PC or FTP server
- Current *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed

Important! If the FTP server fails to start, it could mean that another program using an FTP server is already running. Depending on what operating system you are using, you must go to the device file and disable the FTP server. Refer to Procedure 14-18: "Disable an FTP server on your PC" (p. 14-105) for instructions for each allowed operating system.

Before you begin

Before performing this procedure:

1. Refer to "Before you begin" (p. 2-2) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Verify that new software generic program is available.
3. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for a description of any special considerations required when installing this version of software.

This procedure uses FTP (file transfer protocol) and FTAM-FTP gateway/file transfer translation device (FTTD) to download software to a shelf. FTTD allows Alcatel-Lucent 1665 DMX to function as a gateway network element (GNE) that facilitates file downloads between FTP servers and remote network elements (RNEs) connected to the Alcatel-Lucent 1665 DMX.

Important! If you log in via TCP/IP, your PC must be part of the GNE's TCP/IP Gateway Host List. Refer to Procedure 7-16: "Provision/enable/disable the NE as a TL1 TCP/IP GNE" (p. 7-46) for more information.

Steps

Complete the following steps to download system software via FTTD.

1 Connect the PC and establish a *WaveStar*® CIT session to the gateway Network Element.

Important! You must login via either OSI or TCP/IP.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 From the System View menu, select **Administration** → **Set NE** and enable **File Transfer Protocol (FTP)** and **FTAM-FTP (FTTD) Gateway Control**.

3 Click **OK**.

4 Is your remote NE in the same OSI network as your gateway NE?

If	Then
Yes	Proceed to Step 6.
No	Continue with Step 5.

5 From the System View, select **Administration** → **Data Communications**.

Select the **Network Layer** tab and record the NSAP from the **Network Service Access Point** panel (the NSAP is a 40-digit hex number). This NSAP is required later in this procedure.

6 Establish a *WaveStar*® CIT session to the remote Network Element to which you wish to download the NE software generic.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 Before upgrading the network, perform a backup the NE database.

Reference: Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167)

8 From the System View menu, select **Configuration** → **Software** → **Download Software**.

Result: The *Download Software* window appears.

9 In the pull-down **Download From/Via:** menu, select **FTTD** and verify that the **FTTD** tab is selected.

10 Define the FTAM-FTP Gateway in one of the following ways:

- If the TID of the FTAM-FTP Gateway has been previously defined, select it from the **TID** pull-down menu.

OR

- If the gateway NE and the remote NE are in the same OSI area:
  1. Enter the TID of the FTAM-FTP Gateway in the **TID** field and click **Get NSAP**. (If any fields on this screen are populated, click **Clear** before you enter the TID.)
  2. Click **Add** and then **Save**. The TID is added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this gateway NE's TID.

  OR
- If the gateway NE and the remote NE are *not* in the same OSI area:
  1. In the **FTTD** panel, select **_template_** from the **TID:** pull-down, which pre-populates most of the fields on this form (required value for **Psel** is 02, **Ssel** is 5353, and **Tsel** is 5454).
  2. Click **Modify**.
  3. Replace **_template_** with the TID of the FTAM-FTP gateway.
  4. Complete the NSAP Address panel with the NSAP of the FTTD gateway recorded in Step 5.

     In most cases, you only need to replace the System Identifier (**Sys:**) field with the Mac Address of the FTTD gateway.

     Note: The Mac Address is the first 12 digits of the last 14 digits of the NSAP. The Mac Address of Alcatel-Lucent products begin with "00601D".

     Example: The Mac Address for NSAP Address 39840F8000000000000000000000 00601D2CBC1800 is 00601D2CBC18.
  5. Replace the Selector (**Sel:**) field with "1d".
  6. Click **Add** and then **Save**. The TID has been added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this GNE's TID.

11 Select the **FTP** tab.

12 Select the connection from the **Profile** pull-down menu and then proceed to Step 14. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the download to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user name/password can be different.)

13 If you entered connection information in Step 12 and wish to keep the information for future backups:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

Important! Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

14 In the **Source/Destination Directory Path** panel, enter the current location of the generic to be downloaded or use the **Browse** button (if available) to select the generic to be downloaded. If the FTP server is either undefined or not the local host, the **Browse** button is greyed out.

Important! If you selected the default installation location for the *WaveStar*® CIT and software generic: **\generics\DMX\9.1.0\p**. If necessary, replace 9.1.0 with your current release, for example 9.1.1. The *WaveStar*® CIT automatically populates the FTAM Responder and NSAP fields. Click **Next**.

The value of the Path field can be either an absolute path or a relative path that is relative to the FTAM server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p**. If necessary, replace 9.1.0 with your current release, for example 9.1.1. The syntax of the relative path must start with the path name; for example: **\generics\DMX\9.1.0\p**.

15 In the **Product Type** panel, select the product type of the software generic that you are downloading (not necessarily the same as the NE to which you are downloading).

16 Click **OK**.

Result: A warning message appears asking you to confirm executing this command. Verify the information and click **Yes**. While the download is in progress, a progress indicator window is present.

The download takes approximately 30 minutes.

The download can be cancelled any time by pressing the **Cancel** button on the progress screen.

When the transfer is complete, the *Progress Indicator* window closes and the download software successful window appears. Click **OK**.

17 Do you wish to observe the FTP download progress?

If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 18.
No	Continue with Step 18.

18 **Important!** Do NOT insert a new circuit pack in the shelf until after you apply the new software generic and clear the `dormant/exec version mismatch` condition.

Do you wish to apply (activate) the software generic that you recently downloaded to the dormant area of the Alcatel-Lucent 1665 DMX shelf?

If...	Then...
Yes	Proceed to Procedure 2-8: "Apply software generic" (p. 2-141) and then continue with Step 19.
No	Continue with Step 19.

19 Do you wish to upgrade additional shelves via FTTD?

If...	Then...
Yes	Repeat this procedure from Step 2 for each shelf that you wish to upgrade via FTTD.
No	STOP! End of Procedure.

END OF STEPS

Procedure 2-7: Copy software generic to a remote shelf

Overview

Use this procedure to copy a supported software generic from your Alcatel-Lucent 1665 DMX 9.1.x shelf to a supported remote NE.

Important! This procedure requires that the software generic to be copied be installed in the Dormant areas of the NVMs installed in the LNW2 in your source Alcatel-Lucent 1665 DMX shelf.

You must also have OSI connectivity (via your OSI LAN or DCC) between the source and the destination NEs.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required:

- CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port
- Software generic in the Dormant areas of the NVMs installed in the LNW2 in your source Alcatel-Lucent 1665 DMX shelf.

Before you begin

Before performing this procedure, refer to "Before you begin" (p. 2-2) in this chapter and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

This procedure requires that the software generic being copied is installed in the Dormant areas of the NVMs installed in the LNW2 of the source Alcatel-Lucent 1665 DMX shelf. You must also have OSI connectivity (via OSI LAN or DCC) between the source and the destination NEs.

This procedure uses the **`cpy-prgm`** command to copy a software generic from an in-service Alcatel-Lucent 1665 DMX 9.1.x shelf to the following types of remote NEs:

- Alcatel-Lucent 1665 DMX
- Alcatel-Lucent 1665 DMXtend
- *Metropolis*® DMX*press*
- Alcatel-Lucent 1850 TSS-5
- DDM-2000 OC-3
- DDM-2000 OC-12
- DDM-2000 FiberReach

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend are the only NEs that can accept a software generic of another product type. For example, if your remote NE is an Alcatel-Lucent 1850 TSS-5 shelf, the only product type that you can copy to the Alcatel-Lucent 1850 TSS-5 shelf is dmxplore.

Steps

Complete the following steps to copy a supported software generic from your Alcatel-Lucent 1665 DMX 9.1.x shelf to a supported remote NE.

1 Establish a *WaveStar*® CIT session and log in to the **source** shelf (the shelf with the desired generic in the Dormant areas of the NVMs installed in the LNW2).

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 From the System View menu, select **Configuration** → **Software** → **Copy Software**.

Result: The *Copy Software* screen appears.

3 In the *Copy Software* screen, what are the Product Type and Release of the Dormant Software Generic?

If...	Then...
dmx and Release 7.x, 8.x, or 9.x or dmxtend and Release 4.x, 8.x, or 9.x	Your destination shelf must be either an Alcatel-Lucent 1665 DMX 7.0/7.1/8.0/9.0/9.1 NE or Alcatel-Lucent 1665 DMXtend 5.0/5.1/8.0/9.0 NE, equipped with an LNW2. You cannot copy the 7.x/8.x/9.x or 5.x/8.x/9.x generic to an Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend destination shelf equipped with an LNW1; the 7.x/8.x/9.x or 5.x/8.x/9.x generic does not physically fit in the LNW1 controller.
dmx and 5.x or earlier or dmxtend and 3.x	Your destination shelf can be either an Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend NE. If your destination shelf is equipped with an LNW1, you cannot apply the generic on the destination shelf but you can then copy the generic to another NE from that shelf.

If...	Then...
dmxpress dmxplore ddmoc3 ddmoc12 fbrrch *Release is not a concern for these product types.*	Your destination shelf must be of the same product type as the Dormant generic you are copying. The generic can be applied to that destination shelf. Your destination shelf can also be either an Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend NE. However, you cannot apply the generic on the destination shelf but you can then copy the generic to another NE from that shelf.

4 From the *Copy Software* screen, select the following fields accordingly:

1. In the pull-down menu entitled **Destination TID:** field, select the TID of the remote NE to which you wish to copy the software generic.

   Currently, Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, and Alcatel-Lucent 1850 TSS-60 are the only products that can store a second software generic for either Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, *Metropolis*® DMX*press*, Alcatel-Lucent 1850 TSS-5, DDM-2000 OC-3, DDM-2000 OC-12, or FiberReach. For example, if your remote NE is a *Metropolis*® DMX*press* shelf, then your software generic type must also be *Metropolis*® DMX*press*.
2. In the pull-down menu entitled **Generic Product Type:** select the type of software that you are copying. Your choices are:
   - DMX
   - DMXpress
   - DMXtend
   - DMXplore
   - DDM-2000 OC-3
   - DDM-2000 OC-12
   - FIBER REACH
3. The **Software Generic** panel displays the generic that currently resides in the Dormant area of the NVMs installed in the LNW2 in your source Alcatel-Lucent 1665 DMX. The type of software is identified by the following entry in the Product Type column:
   - dmx = Alcatel-Lucent 1665 DMX
   - dmxtend = Alcatel-Lucent 1665 DMXtend
   - dmxpress = *Metropolis*® DMX*press*
   - dmxplore = Alcatel-Lucent 1850 TSS-5
   - ddmoc3 = DDM OC-3

- ddmoc12 = DDM-2000 OC-12
- fbrrch = FIBER REACH

It is not necessary (or possible) to select the generic. The NE automatically selects the generic in the Dormant area. The information is provided so you are aware of the release number of the specific generic.

4. Click **OK**.

   Important! During the remote copy, the destination shelf (assuming Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, or Alcatel-Lucent 1850 TSS-5) produces the `remote install/copy program IP` Standing Condition (SC) autonomous message.

   The source shelf (assuming Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or *Metropolis*® DMX*press*) produces the `copy program IP` Standing Condition (SC) autonomous message.

   If logged in to the NE, each condition is visible in the alarm list (click the **Alarm List** button from the System View) and the NE History log (select **Reports** → **NE History Log** from the System View).

   Result: While the copy is in progress, a progress indicator window is present.

   The download takes approximately 30 minutes.

   The copy can be cancelled any time by pressing the **Cancel** button on the progress screen.

5 When the transfer is complete, a message window appears, stating *Copy Software Complete*. Click **OK**.

Result: The software generic is now on the destination shelf.

6 **Important!** If your destination shelf is either an Alcatel-Lucent 1665 DMX NE or an Alcatel-Lucent 1665 DMXtend NE, do NOT insert a new circuit pack in the shelf until after you apply the new software generic and clear the `dormant/exec version mismatch` condition.

Do you wish to apply (activate) the software generic that you recently downloaded to the dormant area of the destination shelf?

If...	Then...
Yes	Continue with Step 7.
No	Proceed to Step 8.

7 Is your destination shelf an Alcatel-Lucent 1665 DMX 5.0/5.1/8.0/9.0/9.1 NE or Alcatel-Lucent 1665 DMXtend 7.0/7.1/8.0/9.0/9.1 NE?

If...	Then...
Alcatel-Lucent 1665 DMXtend 5.0/5.1/8.0/9.0/9.1 NE	If the copied generic was dmxtend 5.0, 5.1, 8.0, or 9.0, proceed to Procedure 2-8: "Apply software generic" (p. 2-141) and then continue with Step 8.
Alcatel-Lucent 1850 TSS-5 5.0/5.1/6.0 NE	If the copied generic was tss-5 5.0, 5.1, or 6.0, proceed to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Provisioning Guide, 365-372-401* to apply or copy the software and then continue with Step 8.
Alcatel-Lucent 1665 DMX 7.0/7.1/8.0/9.0/9.1 NE	Proceed to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) User Operations Guide, 365-372-301* to apply or copy the software and then continue with Step 8.
Other	Refer to the appropriate product documentation to apply or copy the software and then continue with Step 8.

8 Do you wish to copy the software generic to another NE?

If...	Then...
Yes	Repeat this procedure from Step 1.
No	STOP! End of Procedure.

END OF STEPS

Procedure 2-8: Apply software generic

Overview

Use this procedure to apply (activate) a software generic currently in the Dormant area of an NVM in the LNW2.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Before performing this procedure,

- Refer to "Before you begin" (p. 2-2) and "Required equipment" (p. 2-2) in this chapter.
- Ensure that no loopbacks exist on the shelf.
  1. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**.

     Print or save the existing loopbacks to be released, then click **Close**.
  2. Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.

  Important! Do *NOT* insert circuit packs into the shelf until after the apply is complete. The apply is not complete if the Alarm List contains either a `dormant/exec code mismatch` or a `waiting for download` condition. Waiting for download indicates that there is at least one circuit pack that requires a firmware upgrade.

Steps

Complete the following steps to apply (activate) a Dormant or Previous software generic.

1 From the System View menu, select **Configuration** → **Software** → **Apply Software**.

Result: The *Apply Software* window appears.

2 Select and/or enter the following information in the *Apply Software* window:

1. From the **Available Generics** panel, select the software generic (Previous or Dormant) to be activated.
2. From the **Activation Scheduling** panel, you can schedule the activation time and date in *one* of the following ways:
   - Select **Install Immediately**. The software installs as soon as possible after you click **OK** and accept the warning screen.

     This installation option cannot be cancelled.
   - Select **Install In 15 Minutes**. The software installs 15 minutes after you click **OK**.
   - Select **Specify Install Date/Time** and select the **Year**, **Month**, **Date**, and **Time**.

   You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.
   - If your time format preference is a 12-hour clock, select **Hour:** (0–12), **Minutes:** (0–59), and **Seconds:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
   - If your time format preference is a 24-hour clock, select the **Hour:** (0–23), **Minutes:** (0–59), and **Seconds:** (0–59) from the pull-down menus.
3. From the **Apply Type** panel, select one of the following Types:
   - **Smart** (default): Upgrades the SYSCTL and smart circuit packs if the version of software on the circuit pack is different from the version of the dormant software generic.

     If the upgrade affects service on a smart OLIU circuit pack, the software apply (activation) command is denied.
   - **Smart, Override Alarms**: Upgrades the SYSCTL and smart circuit packs if the version of software on the circuit pack is different from the version of the dormant software generic.

     This also includes service-affecting upgrades to smart OLIU circuit packs.
4. Click **OK**.

   A warning message appears asking you to confirm the execution of this command.
5. Click **OK** to continue or **Cancel** to return to the *Apply Software* screen.

   While the Apply is in progress, two conditions appear in the Alarm List, `install program IP` (software is installing) and `generic validation IP` (the generic and the databases on the NVMs are being compared).

Important! You can cancel a scheduled apply that was scheduled by selecting either *Install In 15 Minutes* or *Specify Install Date/Time* any time before the software applies. Select **Configuration** → **Software** → **Apply Software** menu, select the generic that is scheduled to install, select **Cancel Install**, and then click **OK**.

3 Approximately 15 minutes after the scheduled apply time, the apply is complete.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress.

When the confirmation screen appears, click **OK**.

Result: The *System View* closes.

4 Establish a *WaveStar*® CIT session (depending on the physical connection used) and log in again to your Alcatel-Lucent 1665 DMX shelf.

Result: The title bars of the *System View* and the legal notice both reflect the current NE software generic, for example 9.1.0.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

5 Is the Generic Software Version correct?

If...	Then...
Yes	The generic was successfully installed on the SYSCTL. If necessary, the firmware on the smart circuit packs is now upgraded. In the Alarm List, the `waiting for download` condition is present for the circuit packs that are waiting for their firmware to be upgraded. STOP! End of Procedure.
No	Contact your next level of support.

END OF STEPS

Procedure 2-9: Backup and restore NE database using SFTP

Overview

Use this procedure to backup and restore the NE database or to setup an automatic backup schedule using SFTP.

Important! You must have TCP/IP connectivity between your NE and your SFTP server, and your NE must have a defined IP address.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure,

1. Refer to "Before you begin" (p. 2-2) and "Required equipment" (p. 2-2) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

   Important! The *WaveStar*® CIT is not SSH FTP (SFTP) server. You must have access to an SSH FTP server to use this feature.

The backup feature can be forced or scheduled to complete automatically at specified intervals.

If you log in using TCP/IP, your PC must be part of the GNE's TCP/IP Gateway Host List. (Refer to Procedure 7-16: "Provision/enable/disable the NE as a TL1 TCP/IP GNE" (p. 7-46).)

Steps

Complete the following steps to backup and restore the system.

1 Connect the PC and establish a *WaveStar*® CIT session with the gateway NE.

Important! You must have TCP/IP connectivity between your NE and your SFTP server, and your NE must have a defined IP address.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2

If	Then
performing an immediate system backup,	Proceed to Procedure 2-9.1: "Backup NE database using SFTP" (p. 2-146).

If	Then
scheduling or discontinuing an automatic system backup,	Proceed to Procedure 2-9.2: "Provision automatic database backup schedule using SFTP" (p. 2-148).
performing a system restore,	Proceed to Procedure 2-9.3: "Restore NE database using SFTP" (p. 2-151).

END OF STEPS

Procedure 2-9.1: Backup NE database using SFTP

Overview

Use this procedure to backup the NE database using SFTP.

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Steps

Complete the following steps to backup the NE database using SFTP.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **SFTP**.

3 Select a connection profile from the **Profile** pull-down menu and proceed to Step 5. *OR*
Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the SFTP server.
2. If necessary, enter the **port** (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 22 is valid if entered.
3. In the **User** panel, enter the user name and password for your SFTP server.

4 If you entered connection information in Step 3 and wish to keep the information for future backups:

1. Enter a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

5 In the **Source/Destination Directory Path** field, enter the path where you want to save the backup file, starting at the SFTP home directory on the server.

6 Click **OK**.

You will be asked to verify that you wish to backup to the directory that you entered above. Click **Yes** if you entered the path correctly.

Result: The *Progress Indicator* appears to indicate that the backup is in progress. When the backup completes, a *WaveStar*® CIT information screen appears that indicates `Remote Backup Successful`. Click **OK**. The backup file is now stored at the location you defined.

END OF STEPS

Procedure 2-9.2: Provision automatic database backup schedule using SFTP

Overview

Use this procedure to provision an automatic backup schedule using SFTP.

Steps

Complete the following steps to provision an automatic backup schedule using SFTP.

1 From the System View menu, select **Configuration** → **Software** → **Configure Auto Backup Interval**.

2 From the *Configure Auto Backup Interval* window, select the **Files** tab at the top of the window.

3 In the pull-down **Backup To/Via:** menu, select **SFTP**.

4 Select a connection profile from the **Profile** pull-down menu and then proceed to Step 6.
OR Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the SFTP server.
2. If necessary, enter the **port** (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 22 is valid if entered.
3. In the **User** panel, enter the user name and password for the SFTP server.

5 If you entered connection information in Step 4 (rather than selected an established profile), you should assign a new profile name to this information to allow Automatic Backup to store the SFTP login password.

1. Enter a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply**, and Save buttons *or* removed using the **Delete** button.

6 In the **File Path:** field, enter the full path starting at the SFTP home directory on the server.

7 From the **Type:** menu in the **Backup Type** panel, select **Forced** from the pull-down menu.
NOTE: No other options are available at this time.

8 From the **Files:** menu in the **Number Of Files** panel, select a number from 1 to 9 (default is 2) from the pull-down menu, which indicates the number of backup files to be stored automatically before the files begin to overwrite.

Once established, the filename that you supplied in Step 6 will initially be appended with "1" (FILENAME1). In subsequent backups, the "1" will increase by one until the number selected in this step is reached; then the files will begin overwriting beginning with FILENAME1.

9 Select the **Schedule** tab at the top of the window.

10 From the **Days** menu in the **Update Interval** panel, select a number from 1 to 99 (default is 30), which indicates the number of days between automatic backups. The number may be selected by sliding the arrow over the scale until the desired number appears in the field, or by typing the number directly into the field.

Important! Setting this field to "0" cancels automatic backup.

11

If you...	Then...
wish to provision a start date and start time for the automatic backup,	perform the following to provision the start date: 1. Select **Specify Date** in the **Backup Start Date/Time** panel, 2. Select the **Year:** and **Month:** from the pull-down menus 3. Select a day from the calendar. Proceed to Step 12 to provision the start time.
wish to only provision the start time for the automatic backup,	Proceed to Step 12 to provision the start time.
do not wish to provision the start date or start time for the automatic backup,	Proceed to Step 13. The first backup will begin immediately upon completion of this procedure and the next backup will begin after the requested number of days.

12 To provision a start time for the automatic backup:

1. Select **Specify Time** in the **Backup Start Date/Time** panel,
2. You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking on the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.
   - If your time format preference is a 12-hour clock, select **Hour:** (0-12), **Minutes:** (0-59), and **Seconds:** (0-59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
   - If your time format preference is a 24-hour clock, select the **Hour:** (0-23), **Minutes:** (0-59), and **Seconds:** (0-59) from the pull-down menus.

   It is recommended that only one backup occur at a time for the CIT. However, larger servers may be able to handle multiple backups at the same time. It is suggested that the backups for the networks be performed a few minutes apart.

13 Click **OK**.

Result: A warning appears indicating that executing this command may temporarily affect service. If this is acceptable, select **Yes**.

END OF STEPS

Procedure 2-9.3: Restore NE database using SFTP

Overview

Use this procedure to restore the NE database using SFTP.



NOTICE

Service-disruption hazard

Restoring the network element database can be service-affecting.

If provisioning changes were made after the last backup files were created, examine the Security Log and use the appropriate WaveStar® *CIT commands to manually apply the recent provisioning changes to the just-restored database.*

Steps

Complete the following steps to restore the NE database using SFTP.

1 From the System View menu, select **Configuration** → **Software** → **Remote Restore**.

Important! The restore feature only works if the TID, the software release and the equipment that populated the NE slots has not changed since the last backup. Additional equipment is allowed. However, if any service-related parameters (for example, cross-connections) have been changed since the last backup file was created, those changes will be lost and service may be affected. These changes must be reentered. If the TID or the software release has changed or if different circuit pack types have been installed since the backup was performed, then the restore will not work.

2 In the pull-down **Restore From/Via:** menu, select **SFTP**.

3 Select the connection from the **Profile** pull-down menu and then proceed to Step 6. *OR*
Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the SFTP server.
2. If necessary, enter the **port** (default is blank). Defining the port is not required for the restore to execute successfully. However, a value of 22 is valid if entered.
3. In the **User** panel, enter the user name and password for the SFTP server.

4 If you entered connection information in Step 3 and wish to keep the information for future restores:

1. Enter a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply,** and Save buttons or removed using the **Delete** button.

5 In the pull-down **Class:** menu, select

- *RESTORE* to restore the complete database.

  If there are Ethernet cross-connections and the database is restored with Class: *RESTORE*, then the VLNC2, VLNC5x, and VLNC3x circuit packs are hard-reset. The circuit pack resets can cause an outage of up to two minutes.
- *RESTORE_CKTID* to restore only the circuit IDs.

  This restore option does not reset any device or circuit pack; it is hitless. This circuit ID restoration can be used when replacing a VLNC2 SYSCTL.

6 In the **Source/Destination Directory Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Procedure 2-9.1: "Backup NE database using SFTP" (p. 2-146) or Procedure 2-9.2: "Provision automatic database backup schedule using SFTP" (p. 2-148).

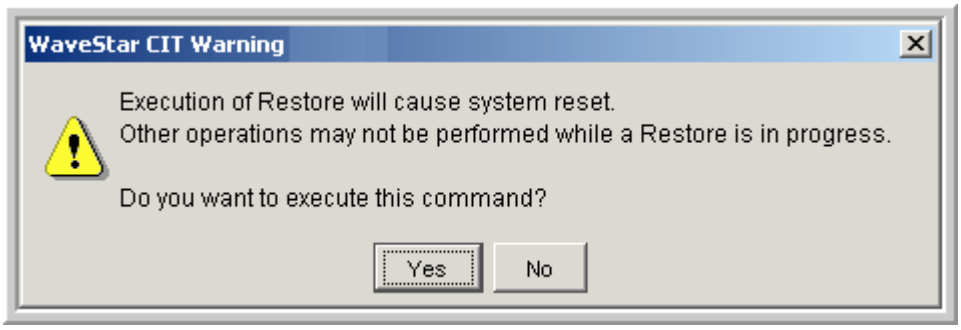
7 Click **OK**.

You will be asked to verify that you wish to restore from the directory that you entered above. Click **`Yes`** if your path is correct.

8 In Step 5, which Class did you select?

If...	Then...
RESTORE	Continue with Step 9.
RESTORE_CKTID	Proceed to Step 11.

9 A second warning screen appears.



If this is acceptable, click **Yes**.

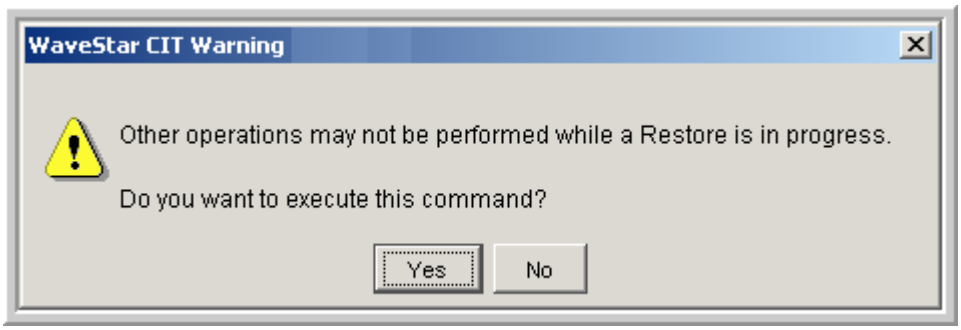
Result: The *Progress Indicator* window opens, indicating that the restore is in progress. When the restore is complete, a *WaveStar*® CIT warning screen appears, stating *NE reset after successful restore, CIT is going to log out*.

10 Click **OK**.

Result: A third *WaveStar*® CIT warning screen appears, stating *Communication to network element is lost, system view will now be closed.*

Proceed to Step 12.

11 A second warning screen appears.



If this is acceptable, click **Yes**.

Result: The *Progress Indicator* window opens, indicating that the restore is in progress. When the restore is complete, a *WaveStar*® CIT confirmation screen appears.

Continue with Step 12.

12 Click **OK**.

Important! If automatic synchronization is unsuccessful, the date and time must be reset manually.

Reference: Procedure 7-10: “Set date and time” (p. 7-31)

END OF STEPS

Procedure 2-10: Backup and restore NE database via FTP

Overview

Use this procedure to backup and restore the NE database or to set up an automatic backup schedule via FTP.

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to "Required equipment" (p. 2-2) listed in this chapter, CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port (required for TCP/IP connectivity) is also required.

Before you begin

Before performing this procedure,

1. Refer to "Before you begin" (p. 2-2) and "Required equipment" (p. 2-2)in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

The *WaveStar*® CIT is not a fully implemented FTP server, but it can handle backup and restore capabilities. For automatic backups, OMS or another large capacity FTP server can be used. The *WaveStar*® CIT is *not* recommended for automatic backups.

The backup feature can be forced or scheduled to complete automatically at specified intervals.

If you log in via TCP/IP, your PC must be part of the GNE's TCP/IP Gateway Host List. Refer to Procedure 7-16: "Provision/enable/disable the NE as a TL1 TCP/IP GNE" (p. 7-46) for more information.

Important! If the FTP server associated with the *WaveStar*® CIT fails to start, it could mean that another program using an FTP server is already running. Depending on what operating system you are using, you must go to the device file and disable the FTP server. Refer to Procedure 14-18: "Disable an FTP server on your PC" (p. 14-105) for instructions for each allowed operating system.

Steps

Complete the following steps to backup and restore the system.

1 Connect the PC and establish a *WaveStar*® CIT session with the gateway NE.

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 From the System View menu, select **Administration** → **Set NE** and enable **File Transfer Protocol**.

3 Click **OK**.

4

If...	Then...
performing an immediate system backup,	Proceed to Procedure 2-10.1: "Backup NE database via FTP" (p. 2-157).
scheduling or discontinuing an automatic system backup,	Proceed to Procedure 2-10.2: "Provision automatic database backup schedule via FTP" (p. 2-160).
performing a system restore,	Proceed to Procedure 2-10.3: "Restore NE database via FTP" (p. 2-164).

END OF STEPS

Procedure 2-10.1: Backup NE database via FTP

Overview

Use this procedure to backup the NE database via FTP.

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Required equipment

Refer to "Required equipment" (p. 2-155) in Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155).

Steps

Complete the following steps to backup the NE database via FTP.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **FTP**.

3 Select the connection from the **Profile** pull-down menu and proceed to Step 5. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

4 If you entered connection information in Step 3 and wish to keep the information for future backups:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

5 In the **Source/Destination Directory Path** field, enter **\backups\<filename>** if you wish to save the backup file to the default location. (If the *WaveStar*® CIT is the FTP server, a maximum of 80 characters is suggested for this field.)

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

6 Click **OK**.

You are asked to verify that you wish to backup to the directory that you entered. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears, indicating that the backup is in progress. When the backup completes, a `Remote Backup successful` screen appears. Click **OK**. The backup file is now stored. If the default path and a subdirectory were used, the file can be found at:

```
C:\Program Files\Alcatel-Lucent\\WaveStar CIT\backups\
<subdirectory>\<filename>
```

If you had an older *WaveStar®* CIT installed prior to installing the current *WaveStar®* CIT, the path could start with C:\Program Files\Lucent Technologies\.

END OF STEPS

Procedure 2-10.2: Provision automatic database backup schedule via FTP

Overview

Use this procedure to provision an automatic backup schedule via FTP.

Required equipment

Refer to "Required equipment" (p. 2-155) in Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155).

Steps

Complete the following steps to provision an automatic backup schedule.

1 From the System View menu, select **Configuration** → **Software** → **Configure Auto Backup Interval**.

Important! If the *WaveStar*® CIT is guaranteed to be available (connected and running) at all scheduled backup times, the *WaveStar*® CIT can serve as an FTP server. OMS or another large capacity FTP server can also be used.

2 From the *Configure Auto Backup* screen, select the **Files** tab at the top of the screen.

3 In the pull-down **Backup To/Via:** menu, select **FTP**.

4 Select the connection from the **Profile** pull-down menu and then proceed to Step 6. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

5 If you entered connection information in Step 4 (rather than selected an established profile), assign a new profile name to this information to allow Automatic Backup to store the FTP login password. To assign a new profile name:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **FTP Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons *or* removed using the **Delete** button.

6 In the **File Path:** field, enter **\backups\<filename>** if you wish to save the backup file to the default location. (If the *WaveStar*® CIT is the FTP server, a maximum of 80 characters is suggested for this field.)

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

7 From the **Type:** menu in the **Backup Type** panel, select **Forced** from the pull-down menu. *NOTE: No other options are available at this time.*

8 From the **Files:** menu in the **Number Of Files** panel, select a number from 1 to 9 (default is 2) from the pull-down menu, which indicates the number of backup files to be stored automatically before the files begin to overwrite.

Once established, the filename that you supplied in Step 6 is appended with "1" (FILENAME1). In subsequent backups, the "1" increases by one until the number selected in this step is reached; then the files begins overwriting beginning with FILENAME1.

9 Select the **Schedule** tab at the top of the screen.

10 From the **Days** menu in the **Update Interval** panel, select a number from 1 to 99 (default is 30), which indicates the number of days between automatic backups. Select the number by sliding the arrow over the scale until the desired number appears in the field.

Important! Setting this field to "0" cancels automatic backup.

11

If you...	Then...
wish to provision a start date and start time for the automatic backup,	Perform the following to provision the start date: 1. Select **Specify Date** in the **Backup Start Date/Time** panel, 2. Select the **Year:** and **Month:** from the pull-down menus 3. Select a day from the calendar. Proceed to Step 12 to provision the start time.
wish to only provision the start time for the automatic backup,	Proceed to Step 12 to provision the start time.
do not wish to provision the start date or start time for the automatic backup,	Proceed to Step 13. The first backup begins immediately upon completion of this procedure and the next backup begins after the requested number of days.

12 To provision a start time for the automatic backup:

1. Select **Specify Time** in the **Backup Start Date/Time** panel,
2. You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.
   - If your time format preference is a 12-hour clock, select **Hour:** (0–12), **Minutes:** (0–59), and **Seconds:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
   - If your time format preference is a 24-hour clock, select the **Hour:** (0–23), **Minutes:** (0–59), and **Seconds:** (0–59) from the pull-down menus.

   It is recommended that only one backup occur at a time for the CIT. However, larger servers can be able to handle multiple backups at the same time. Network backups should be performed a few minutes apart.

13 Click **OK**.

A warning screen appears, indicating that execution of provision can temporarily affect service. Select **Yes**.

END OF STEPS

Procedure 2-10.3: Restore NE database via FTP

Overview

Use this procedure to restore the NE database using FTP.

Required equipment

Refer to "Required equipment" (p. 2-155) in Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155).

Steps

Complete the following steps to restore the NE database via FTP.

1 

NOTICE

Service-disruption hazard

Restoring the network element database can be service-affecting.

If provisioning changes are made after the last backup files were created, examine the Security Log and use the appropriate WaveStar® *CIT commands to apply the recent provisioning changes manually to the just-restored database.*

From the System View menu, select **Configuration** → **Software** → **Remote Restore**.

Important! If the TID has changed since the backup was performed, then the restore is denied. The software release of the backup database must be the same as the current software generic. In addition, if any service-related parameters (for example, cross-connections) have been changed since the last backup file was created, those changes are lost and service can be affected. These changes must be reentered.

2 In the pull-down **Restore From/Via:** menu, select **FTP**.

3 Select the connection from the **Profile** pull-down menu and then proceed to Step 5. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

4 If you entered connection information in Step 3 and wish to keep the information for future restores:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

5 In the **Source/Destination Directory Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Procedure 2-10.1: "Backup NE database via FTP" (p. 2-157) or Procedure 2-10.2: "Provision automatic database backup schedule via FTP" (p. 2-160) (For example: **`\backups\<subdirectory>\<filename>`**).

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

6 Click **OK**.

You are asked to verify that you wish to restore from the directory that you entered. Click **Yes** if you typed the path correctly.

A second warning screen appears that states that Execution of RESTORE causes a System Reset. Click **Yes**.

Result: The *Progress Indicator* screen appears, indicating that the restore is in progress. When the restore is complete, a *WaveStar*® CIT warning screen appears, stating *NE reset after successful restore, CIT is going to log out*.

7 Click **OK**.

Result: A second *WaveStar*® CIT warning screen appears, stating *Communication to network element is lost, system view will now be closed.*

8 Click **OK**.

END OF STEPS

Procedure 2-11: Backup and restore NE database via FTTD

Overview

Use this procedure to backup and restore the NE database or to set up an automatic backup schedule via FTAM-FTP gateway or file transfer translation device (FTTD) for a remote NE without direct TCP/IP connectivity.

Privilege level

You must login as a Privileged user to complete this procedure.

Required equipment

In addition to "Required equipment" (p. 2-2) listed in this chapter, CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port (required for TCP/IP connectivity) is also required.

Before you begin

Before performing this procedure,

1. Refer to "Before you begin" (p. 2-2) and "Required equipment" (p. 2-2) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

Alcatel-Lucent 1665 DMX can also act as an FTAM-FTP gateway or file transfer translation device (FTTD). The FTTD allows Alcatel-Lucent 1665 DMX to function as a gateway network element (GNE) that facilitates file downloads between FTP servers and remote network elements (RNEs) connected to the Alcatel-Lucent 1665 DMX.

This procedure uses FTP (file transfer protocol) and FTAM (file transfer and access management) to backup and restore all Alcatel-Lucent 1665 DMX provisionable data on a shelf.

The *WaveStar*® CIT is not a fully implemented FTP server, but it can handle backup and restore capabilities. For automatic backups, OMS or another large capacity FTP server can be used. The *WaveStar*® CIT is *not* recommended for automatic backups.

The backup feature can be forced or scheduled to complete automatically at specified intervals.

If you log in via TCP/IP, your PC must be part of the GNE's TCP/IP Gateway Host List. Refer to Procedure 7-16: "Provision/enable/disable the NE as a TL1 TCP/IP GNE" (p. 7-46) for more information.

Important! If the FTP server associated with the *WaveStar*® CIT fails to start, it could mean that another program using an FTP server is already running. Depending on what operating system you are using, you must go to the device file and disable the FTP server. Refer to Procedure 14-18: "Disable an FTP server on your PC" (p. 14-105) for instructions for each allowed operating system.

Steps

Complete the following steps to backup and restore the system.

1 Connect the PC and establish a *WaveStar*® CIT session to the gateway Network Element.

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 From the System View menu, select **Administration** → **Set NE** and enable **File Transfer Protocol (FTP)** and FTAM-FTP (FTTD) Gateway Control.

3 Click **OK**.

4 Is your remote NE in the same OSI network as your gateway NE?

If	Then
Yes	Proceed to Step 6.
No	Continue with Step 5.

5 From the System View, select **Administration** → **Data Communications**.

Select the **Network Layer** tab and record the NSAP from the **Network Service Access Point** panel (the NSAP is a 40-digit hex number). This NSAP is required later in this procedure.

6 Establish a *WaveStar*® CIT session to the remote Network Element.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7

If...	Then...
performing an immediate system backup,	Proceed to Procedure 2-11.1: "Backup NE database via FTTD" (p. 2-170).
scheduling or discontinuing an automatic system backup,	Proceed to Procedure 2-11.2: "Provision automatic database backup schedule via FTTD" (p. 2-173).
performing a system restore,	Proceed to Procedure 2-11.3: "Restore NE database via FTTD" (p. 2-178).

END OF STEPS

Procedure 2-11.1: Backup NE database via FTTD

Overview

Use this procedure to backup the NE database via FTAM-FTP gateway or file transfer translation device (FTTD) for a remote NE without direct TCP/IP connectivity.

Required equipment

Refer to "Required equipment" (p. 2-167) in Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167).

Steps

Complete the following steps to backup the NE database via FTTD.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup** .

2 In the pull-down **Backup To/Via:** menu, select **FTTD** and verify that the **FTTD** tab is selected.

3 Define the FTAM-FTP Gateway in one of the following ways:

- If the TID of the FTAM-FTP Gateway has been previously defined, select it from the **TID** pull-down menu.

  OR

- If the gateway NE and the remote NE are in the same OSI area:

  1. Enter the TID of the FTAM-FTP Gateway in the **TID** field and click **Get NSAP**. (If any fields on this screen are populated, click **Clear** before you enter the TID.)
  2. Click **Add** and then **Save**. The TID is added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this gateway NE's TID.

  OR

- If the gateway NE and the remote NE are *not* in the same OSI area:
  1. In the **FTTD** panel, select **_template_** from the **TID:** pull-down, which pre-populates most of the fields on this form (required value for **Psel** is 02, **Ssel** is 5353, and **Tsel** is 5454).
  2. Click **Modify**.
  3. Replace **_template_** with the TID of the FTAM-FTP gateway NE.
  4. Edit the NSAP Address fields as required. Refer to Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167), Step 5.
  5. Verify that the Selector (**Sel:**) field is "1d" .
  6. Click **Add** and then **Save**. The TID has been added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this GNE's TID.

4 Select the **FTP** tab.

5 Select the connection from the **Profile** pull-down menu and then proceed to Step 7. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

6 If you entered connection information in Step 5 and wish to keep the information for future backups:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Important! Entries to the **FTP Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

7 In the **Source/Destination Directory Path** field, enter **`\backups\<filename>`**. (If the *WaveStar*® CIT is the FTP server, a maximum of 80 characters is suggested for this field.)

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

8 Click **OK**.

You are asked to verify that you wish to backup to the directory that you entered. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears, indicating that the backup is in progress. When the backup completes, a `Remote Backup successful` screen appears. Click **OK**. The backup file is now stored. If the default path and a subdirectory were used, the file can be found at:

```
C:\Program Files\Alcatel-Lucent\\WaveStar CIT\backups\
<subdirectory>\<filename>
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

END OF STEPS

Procedure 2-11.2: Provision automatic database backup schedule via FTTD

Overview

Use this procedure to provision an automatic backup schedule via FTAM-FTP gateway or file transfer translation device (FTTD) for a remote NE without direct TCP/IP connectivity.

Required equipment

Refer to "Required equipment" (p. 2-167) in Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167).

Steps

Complete the following steps to provision an automatic backup schedule via FTTD.

1 From the System View menu, select **Configuration** → **Software** → **Configure Auto Backup Interval** .

Important! If the *WaveStar*® CIT is guaranteed to be available (connected and running) at all scheduled backup times, the *WaveStar*® CITcan serve as an FTP server. OMS or another large capacity FTP server can also be used.

2 From the **Configure Auto Backup** screen, and select the **Files** tab at the top of the screen.

3 In the pull-down **Backup To/Via:** menu, select **FTTD** and select the **FTTD** tab.

4 Define the FTAM-FTP Gateway in **one** of the following ways:

- If the TID of the FTAM-FTP Gateway has been previously defined, select it from the **TID** pull-down menu.

OR

- If the gateway NE and the remote NE are in the same OSI area:
  1. Enter the TID of the FTAM-FTP Gateway in the **TID** field and click **Get NSAP**. (If any fields on this screen are populated, click **Clear** before you enter the TID.)
  2. Click **Add** and then **Save**. The TID is added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this gateway NE's TID.

  OR
- If the gateway NE and the remote NE are *not* in the same OSI area:
  1. In the **FTTD** panel, select **_template_** from the **TID:** pull-down, which pre-populates most of the fields on this form (required value for **Psel** is 02, **Ssel** is 5353, and **Tsel** is 5454).
  2. Click **Modify**.
  3. Replace **_template_** with the TID of the FTAM-FTP gateway NE.
  4. Edit the NSAP Address fields as required. Refer to Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167), Step 5.
  5. Verify that the Selector (**Sel:**) field is "1d" .
  6. Click **Add** and then **Save**. The TID has been added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this GNE's TID.

5 Select the **FTP** tab.

6 Select the connection from the **Profile** pull-down menu and then proceed to Step 8. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however, your user ID/password can be different.)

7 If you entered connection information in Step 6 (rather than selected an established profile), should assign a new profile name to this information to allow Automatic Backup to store the FTP login and password. To assign a new profile:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

Entries to the **FTP Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons *or* removed using the **Delete** button.

8 In the **File Path:** field, enter **\backups\<filename>**. (If the *WaveStar*® CIT is the FTP server, a maximum of 80 characters is suggested for this field.)

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

9 From the **Type:** menu in the **Backup Type** panel, select **Forced** from the pull-down menu. *NOTE: No other options are available at this time.*

10 From the **Files:** menu in the **Number Of Files** panel, select a number from 1 to 9 (default is 2) from the pull-down menu, which indicates the number of backup files to be stored automatically before the files begin to overwrite.

Once established, the filename that you supplied in Step 8 is appended with "1" (FILENAME1). In subsequent backups, the "1" increases by one until the number selected in this step is reached; then the files begins overwriting beginning with FILENAME1.

11 Select the **Schedule** tab at the top of the screen.

12 From the **Days** menu in the **Update Interval** panel, select a number from 1 to 99 (default is 30), which indicates the number of days between automatic backups. The number can be selected by sliding the arrow over the scale until the desired number appears in the field.

Important! Setting this field to "0" cancels automatic backup.

13

If you...	Then...
wish to provision a start date and start time for the automatic backup,	Perform the following to provision the start date: 1. Select **Specify Date** in the **Backup Start Date/Time** panel, 2. Select the **Year:** and **Month:** from the pull-down menus 3. Select a day from the calendar. Proceed to Step 14 to provision the start time.
wish to only provision the start time for the automatic backup,	Proceed to Step 14 to provision the start time.
do not wish to provision the start date or start time for the automatic backup,	Proceed to Step 15. The first backup begins immediately upon completion of this procedure and the next backup begins after the requested number of days.

14 To provision a start time for the automatic backup:

1. Select **Specify Time** in the **Backup Start Date/Time** panel,
2. You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.
   - If your time format preference is a 12-hour clock, select **Hour:** (0–12), **Minutes:** (0–59), and **Seconds:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
   - If your time format preference is a 24-hour clock, select the **Hour:** (0–23), **Minutes:** (0–59), and **Seconds:** (0–59) from the pull-down menus.

   It is recommended that only one backup occur at a time for the CIT. However, larger servers can be able to handle multiple backups at the same time. Network backups should be performed a few minutes apart.

15 Click **OK**.

A warning screen appears, indicating that execution of provision can temporarily affect service. Select **Yes**.

END OF STEPS

Procedure 2-11.3: Restore NE database via FTTD

Overview

Use this procedure to restore the NE database via FTAM-FTP gateway or file transfer translation device (FTTD) for a remote NE without direct TCP/IP connectivity.

Required equipment

Refer to "Required equipment" (p. 2-167) in Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167).

Steps

Complete the following steps to restore the NE database via FTAM-FTP gateway or file transfer translation device (FTTD).

1 

NOTICE

Service-disruption hazard

Restoring the network element database can be service-affecting.

If provisioning changes are made after the last backup files were created, examine the Security Log and use the appropriate WaveStar® *CIT commands to apply the recent provisioning changes manually to the just-restored database.*

From the System View menu, select **Configuration** → **Software** → **Remote Restore**.

Important! If the TID has changed since the backup was performed, then the restore is denied. The software release of the backup database must be the same as the current software generic. In addition, if any service-related parameters (for example, cross-connections) have been changed since the last backup file was created, those changes are lost and service can be affected. These changes must be reentered.

2 In the pull-down **Restore From/Via:** menu, select **FTTD** and select the **FTTD** tab.

3 Define the FTAM-FTP Gateway in one of the following ways:

- If the TID of the FTAM-FTP Gateway has been previously defined, select it from the **TID** pull-down menu.

OR

- If the gateway NE and the remote NE are in the same OSI area:
  1. Enter the TID of the FTAM-FTP Gateway in the **TID** field and click **Get NSAP**. (If any fields on this screen are populated, click **Clear** before you enter the TID.)
  2. Click **Add** and then **Save**. The TID is added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this gateway NE's TID.

  OR
- If the gateway NE and the remote NE are *not* in the same OSI area:
  1. In the **FTTD** panel, select **_template_** from the **TID:** pull-down, which pre-populates most of the fields on this form (required value for **Psel** is 02, **Ssel** is 5353, and **Tsel** is 5454).
  2. Click **Modify**.
  3. Replace **_template_** with the TID of the FTAM-FTP gateway NE.
  4. Edit the NSAP Address fields as required. Refer to Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167), Step 5.
  5. Verify that the Selector (**Sel:**) field is "1d" .
  6. Click **Add** and then **Save**. The TID has been added to the pull-down menu for this CIT. If you replace the SYSCTL in the GNE, re-enter the NSAP address for this GNE's TID.

4 Select the **FTP** tab.

5 Select the connection from the **Profile** pull-down menu and then proceed to Step 7. *OR*
Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password can be different.)

6 If you entered connection information in Step 5 and wish to keep the information for future restores:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

Important! Entries to the **FTP Profile** pull-down menu can be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

7 In the **Source/Destination Directory Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Procedure 2-11.1: "Backup NE database via FTTD" (p. 2-170) or Procedure 2-11.2: "Provision automatic database backup schedule via FTTD" (p. 2-173). For example: **\backups\<subdirectory>\<filename>**.

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT or the IP address of the FTP server is not in the same subnet as the IP address of the shelf.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

8 Click **OK**.

You are asked to verify that you wish to restore from the directory that you entered. Click **Yes** if you typed the path correctly.

A second warning screen appears that states that Execution of RESTORE causes a System Reset. Click **Yes**.

Result: The *Progress Indicator* screen appears, indicating that the restore is in progress. When the restore is complete, a *WaveStar*® CIT warning screen appears, stating *NE reset after successful restore, CIT is going to log out*.

9 Click **OK**.

Result: A second *WaveStar*® CIT warning screen appears, stating *Communication to network element is lost, system view will now be closed.*

10 Click **OK**.

END OF STEPS

Procedure 2-12: Backup and restore NE database via FTAM

Overview

Use this procedure to backup and restore the local NE database via the File Transfer and Access Management (FTAM) protocol. Scheduled automatic backups are not supported using FTAM.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to "Required equipment" (p. 2-2) listed in this chapter, CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the **LAN** or **IAO LAN** port (required for TCP/IP connectivity) is also required.

Before you begin

Before performing this procedure,

1. Refer to "Before you begin" (p. 2-2) and "Required equipment" (p. 2-2) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

Steps

Complete the following steps to backup and restore the system.

1 Connect the PC and establish a *WaveStar*® CIT session to the local Network Element that is to be backed up or restored.

Important! You must login via OSI.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2

If...	Then...
performing an immediate system backup,	Proceed to Procedure 2-12.1: "Backup NE database via FTAM" (p. 2-184).
performing a system restore,	Proceed to Procedure 2-12.2: "Restore NE database via FTAM" (p. 2-186).

END OF STEPS

Procedure 2-12.1: Backup NE database via FTAM

Overview

Use this procedure to backup the local NE database or a remote NE database (with DCC connectivity) via the File Transfer and Access Management (FTAM) protocol to the *WaveStar*® CIT.

Required equipment

Refer to "Required equipment" (p. 2-182) in Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182).

Steps

Complete the following steps to backup an NE database using FTAM.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **FTAM**.

3 In the **Source/Destination Directory Path** field, enter **`\backups\<filename>`**.

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory, enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. If any directory in the path does not exist, the command is denied because this command does not create directories.

4 Click **OK**.

You are asked to verify that you wish to backup to the directory that you entered. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears, indicating that the backup is in progress. When the backup completes, a `Remote Backup successful` screen appears. Click **OK**. The backup file is now stored. If the default path and a subdirectory were used, the file can be found at:

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\backups\
<subdirectory>\<filename>
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

END OF STEPS

Procedure 2-12.2: Restore NE database via FTAM

Overview

Use this procedure to restore the local NE database or a remote NE database (with OSI or DCC connectivity) via the File Transfer and Access Management (FTAM) protocol from the *WaveStar*® CIT.

Required equipment

Refer to "Required equipment" (p. 2-182) in Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182) for a list of equipment required to perform this procedure.

Before you begin

Before performing this procedure, complete Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182).

Steps

Complete the following steps to restore the local NE database.

1 

NOTICE

Service-disruption hazard

Restoring the network element database can be service-affecting.

If provisioning changes are made after the last backup files were created, examine the Security Log and use the appropriate WaveStar® *CIT commands to apply the recent provisioning changes manually to the just-restored database.*

From the System View menu, select **Configuration** → **Software** → **Remote Restore**.

Important! If the TID has changed since the backup was performed, then the restore is denied. The software release of the backup database must be the same as the current software generic. In addition, if any service-related parameters (for example, cross-connections) have been changed since the last backup file was created, those changes are lost and service can be affected. These changes must be reentered.

2 In the pull-down **Restore From/Via:** menu, select **FTAM**.

3 In the **Source/Destination Directory Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Procedure 2-12.1: "Backup NE database via FTAM" (p. 2-184). For example: **\backups\<subdirectory>\<filename>**.

You can also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and select the required file.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:\Program Files\Alcatel-Lucent\WaveStar CIT\
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, the path could start with C:\Program Files\Lucent Technologies\.

4 Click **OK**.

You are asked to verify that you wish to restore from the directory that you entered. Click **Yes** if you typed the path correctly.

A second warning screen appears that states that Execution of RESTORE causes a System Reset. Click **Yes**.

Result: The *Progress Indicator* screen appears, indicating that the restore is in progress. When the restore is complete, a *WaveStar*® CIT warning screen appears, stating *NE reset after successful restore, CIT is going to log out*.

5 Click **OK**.

Result: A second *WaveStar*® CIT warning screen appears, stating *Communication to network element is lost, system view will now be closed.*

6 Click **OK**.

END OF STEPS

3 Acceptance procedures

Overview

Purpose

Use the following procedures to test an out-of-service Alcatel-Lucent 1665 Data Multiplexer or network after another organization has installed and equipped it.

If installation is not complete, notify the installation personnel or refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.

If circuit pack installation is not complete, notify the installation personnel or refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures".

The procedures test a stand-alone Alcatel-Lucent 1665 DMX system after all circuit packs have been installed and the shelf is looped back or after a system has been established end-to-end. They are not intended to be used to equip and turn up a shelf or establish a network.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).
3. Connect PC and establish a *WaveStar*® CIT session. Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

Required equipment

The procedures in this chapter require the following equipment:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedure, that additional equipment is listed in that procedure.

Procedure 3-1: Accept Alcatel-Lucent 1665 DMX shelf

Overview

Use this procedure to test and accept an out-of-service Alcatel-Lucent 1665 Data Multiplexer shelf in a stand-alone state. This procedure is used only if the Alcatel-Lucent 1665 Data Multiplexer shelf was installed by someone else.

Important! It is assumed that the Alcatel-Lucent 1665 DMX is installed, powered, equipped, and free of alarms.

If installation is not complete, notify the installation personnel or refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.

If circuit pack installation is not complete, notify the installation personnel or refer to Chapter 4, “Install and provision circuit packs/OLIUs procedures”.

If the shelf fails to respond in the indicated manner, notify the installation organization that installed the Alcatel-Lucent 1665 DMX or refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to the equipment listed in “Required equipment” (p. 3-2), the following equipment is also required:

- Line buildouts (LBOs)
- Fiber jumpers (LC-Type Connectors)
- DSX-1 or DSX-3 patch cords.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 3-2) in this chapter.
2. Refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) information in Chapter 1, “Safety”.
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs that were installed.
4. If system and circuit pack port parameters were provisioned, ensure that you have a full set of work instructions detailing the provisioned parameter values.

Steps

Complete the following steps to test and accept an out-of-service Alcatel-Lucent 1665 Data Multiplexer shelf in a stand-alone state.

1 Inspect the Alcatel-Lucent 1665 DMX shelf for obvious damage.

2 From the System View menu, select **Reports** → **Equipment Lists** → **Pack**. Highlight *Shelf* and click **Select** to obtain the *Circuit Pack List* for the shelf. Verify that the correct number and type of circuit packs have been installed, as required.

3 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48, LNW82 OC3/OC12/OC48, LNW504 OC-48/OC-192, LNW785 OMD, and/or LNW705 XM10G/8 circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

If required, verify that the shelf is equipped with the deeper shelf cover.

4 

NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Verify 177D Apparatus Blanks or LNW98 circuit packs have been installed in any unused Function/Growth slots on the shelf.

Verify 177E Apparatus Blanks or LNW97 circuit packs have been installed in any unused Main 2 slot.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

5 From the System View menu, select **View** → **Software Generic** and verify that the proper version of software is installed.

Reference: Procedure 14-14: “Retrieve software generic release and database information” (p. 14-92)

6 Test the SYSCTL circuit pack. From the System View menu, select **Fault** → **Test** → **System Controller**. Verify the SYSCTL circuit pack passes the test.

7 If LNW121B–159B or LNW221–259 OLIU circuit packs are installed in the Main slots, ensure that the proper box has been checked on the faceplate Channel Select Option Label. To further verify correct settings, the circuit pack must be removed, option jumpers checked, and the circuit pack reinserted.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

8 If LNW26B, LNW28, or LNW77 OLIU circuit packs are installed in the Main slots, verify circuit pack mode (Normal or Enhanced) is set to **Enhanced**. From the System View menu, select **View** → **Equipment**. Highlight the circuit pack, then click **Select**. The Normal mode is not supported.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

9 **Important!** The LNW59 OC-192, LNW82 OC3/OC12/OC48, LNW202 OC-48, LNW203 OC-12, LNW502 OC-192, and LNW504 OC-48/OC-192 OLIU circuit packs may be equipped with pluggable transmission modules. However, pluggable transmission modules are *not* required when LNW59, LNW82 or LNW504 OLIU circuit packs are used in headless, optics-free, switch applications.

If LNW59, LNW82, LNW202, LNW203, LNW502, or LNW504 OLIU circuit packs are installed in the Main slots, ensure that the required pluggable transmission modules are installed. Verify that all unused sockets are equipped with dust covers.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 Are low-speed OLIU circuit packs installed in any Function/Growth slots?

If…	Then…
Yes,	Continue with Step 11.
No,	Proceed to Step 13.

11 If LNW421–LNW459 OLIU circuit packs are installed in any Function/Growth slots, ensure that the proper box has been checked on the faceplate Channel Select Option Label. To further verify correct settings, the circuit pack must be removed, option jumpers checked, and the circuit pack reinserted.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

12 If LNW37 4OC-3, LNW45 8OC-3, LNW49 4OC-12, LNW55 OC3/OC12/OC48, LNW62 4OC-48, LNW402 OC-48, and/or LNW603 OC-192 circuit packs are installed in any Function/Growth slots, ensure that any required pluggable transmission modules have been installed. Verify that all unused sockets are equipped with dust covers.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

13 **Important!** If the port Signal Type parameter is STNA (Signal Type Not Available) for a port on an LNW55, LNW82, or LNW504 multirate OLIU circuit pack, then the port is not usable and cannot be tested.

Test each usable OLIU port for proper operation, if required.

1. Select **Configuration** → **DCC Terminations** to access the first usable OLIU port and provision *OSI over DCC* as **disabled** to prevent DCC-related alarms. Click **Apply** and **Close**.
2. Loop back the OLIU port to test port functionality. Refer to Procedure 14-6: “Connect OLIU optical loopbacks” (p. 14-58).
3. Remove the lightguide jumper used to loop back the port and the LBO, if required. Verify that the OLIU **FAULT** LED or port LED associated with the pluggable transmission module starts flashing. The **MN** (default level) and **NE** LEDs on the SYSCTL light.
4. Click the **Alarm List** button to obtain the *NE Alarm List* and verify that the alarm is associated with the OLIU port being tested.
5. If required, reinstall the dust plug into the optical ports on the pluggable transmission module to maintain cleanliness.
6. Select **Configuration** → **Update System** → **Update All**. Verify that the OLIU **FAULT** LED or port LED associated with the pluggable transmission module stops flashing and all alarms clear.

Repeat this step for all usable OLIU ports being tested, if required.

14 If LNW63, LNW64, LNW70, LNW73/73C, LNW74, LNW78, LNW87, and/or LNW170 circuit packs are installed in any Function/Growth slots, ensure that any required pluggable transmission modules have been installed. Verify that all unused sockets are equipped with dust covers.

Reference:

- Procedure 4-12: “Install 10/100 Ethernet circuit packs” (p. 4-61)
- Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)
- Procedure 4-17: “Install Fibre Channel circuit packs” (p. 4-102)

15 **Important!** Pre-equipping OMD circuit packs used in DWDM Add/Drop Ring applications with pass-through fiber jumpers minimizes the installation time of pass-through connections when a service is established. Constant travel to pass-through nodes is avoided when a service is added.

If two OMD circuit packs are used for a DWDM Add/Drop Ring application, verify that the pass-through jumpers were installed between the Optical Channel (OCH) ports of the OMD circuit packs in the Function Group.

16 If LNW705 XM10G/8 circuit packs are installed in any Function/Growth slots, ensure that any required pluggable transmission modules have been installed. Verify that all unused sockets are equipped with dust covers.

Reference: Procedure 4-28: “Install 10G Muxponder circuit packs” (p. 4-137)

17 From your work order, verify option settings have been set correctly, if required, and not already performed.

Reference:

- Chapter 6, “System configuration procedures”
- Chapter 7, “System administration procedures”
- Chapter 8, “System performance monitoring procedures”
- Appendix A, “Provisionable parameters”

18 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: “Perform LED test” (p. 14-90)

19 Test IAO LAN ports. From the System View menu, select **Fault** → **Test** → **IAO LAN**. Verify the LAN ports pass the test.

20 **Important!** This procedure assumes that the Alcatel-Lucent 1665 DMX shelf has been connected to the DSX cross-connect panel or equivalent connection point, as required.

Perform stand-alone transmission tests in the *terminal* and/or *facility* directions, as required, to verify proper circuit pack operation and cabling. Refer any failures to the organization that installed the Alcatel-Lucent 1665 DMX.

Reference:

- Procedure 14-9: “Perform DS1/E1 transmission test” (p. 14-69)
- Procedure 14-10: “Perform DS3 transmission test” (p. 14-76)
- Procedure 14-11: “Perform EC-1 transmission test” (p. 14-82)

21 **Important!** *This step is optional.* If the provisionable parameters for the system and installed circuit pack ports have already been provisioned for your application, do not perform this step. This step resets all system provisionable parameters and cross-connections to factory default values. If the system and circuit pack port provisionable parameters have not been provisioned for your application, perform this step to clear the system of any unnecessary settings that may have been made during testing.

If required, select **Fault** → **Reset** → **Initialize System** to reset all system provisionable parameters to default values.

Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

If OLIUs are installed and looped, an `inconsistent DCC values` alarm is reported after the command is executed and communication is reestablished with the network element.

If required, clear any `inconsistent DCC values` alarms by disabling OSI over DCC for the ports. Select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

The system may also report the `holdover mode active` condition since the Timing Mode reverts to External. If desired, select **Configuration** → **Timing/Sync** and provision the **Timing Mode** to Free Running.

If the sockets on the multirate LNW55, LNW82, LNW504, and LNW705 circuit packs are equipped with pluggable transmission modules, the system reports `unexpected or failed Pluggable Transmission Module` alarms. If desired, select **Configuration** → **Equipment** to access the affected ports and provision the port Signal Type parameter the required rate that matches the pluggable transmission module.

22 The Alcatel-Lucent 1665 DMX shelf has passed the acceptance tests.

After each shelf in a SONET/SDH network has been tested, the Alcatel-Lucent 1665 DMX SONET/SDH network is ready for the acceptance testing.Procedure 3-2: “Accept Alcatel-Lucent 1665 DMX SONET/SDH network” (p. 3-10)

If required, refer to Chapter 9, “Network configuration procedures” to place the Alcatel-Lucent 1665 DMX shelf in a network.

END OF STEPS

Procedure 3-2: Accept Alcatel-Lucent 1665 DMX SONET/SDH network

Overview

Use this procedure to test out-of-service Alcatel-Lucent 1665 Data Multiplexer shelves in a SONET/SDH network. This procedure is used only if the Alcatel-Lucent 1665 Data Multiplexer network was installed by someone else.

Important! It is assumed that the Alcatel-Lucent 1665 DMX is installed in a network and each shelf has previously been tested in a stand-alone looped-back configuration. If each shelf has not been tested in a stand-alone looped-back configuration, refer to Procedure 3-1: "Accept Alcatel-Lucent 1665 DMX shelf" (p. 3-3).

Important! If the Alcatel-Lucent 1665 DMX fails to respond in the indicated manner, notify the installation organization that installed the Alcatel-Lucent 1665 DMX or refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 3-2), an optical power meter is also required.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 3-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the engineering data for the network.
4. Verify that the engineering data shows the node target identifiers (TIDs) and fiber connections.

Steps

Complete the following steps to test out-of-service Alcatel-Lucent 1665 Data Multiplexer shelves in a network.

1 At each node in the network, select **Administration** → **View NE Administration** from the System View menu and verify that the network element parameters agree with the engineering data.

2 **Important!** At least one node in the network should be set for DS1 External or Free Running. No more than one node in the network should be Free Running.

In order to enable sync autoreconfiguration, Sbyte (sync messaging) must also be enabled.

At each node in the network, select **View** → **Timing/Sync** and verify that the system timing information agrees with the engineering data.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

3 Determine the optical loss of each optical span from office records or by making the required measurements. Verify that the correct LBOs have been installed and the fiber are connected.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

4 At each node in the network, select **View** → **DCC Terminations** and verify that the DCC Channel Status parameters agree with the engineering data.

5 At each node in the network, select **Administration** → **OSI Neighbor Map** and verify that the nodes are properly connected with adjacent nodes, as required.

6 Perform the end-to-end optical line test on all optical spans. Report any failures to the organization that installed the Alcatel-Lucent 1665 DMX shelf.

Reference:

- Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)
- Procedure 14-8: "Perform end-to-end optical line test on Function OLIUs" (p. 14-66)

7 Perform end-to-end transmission tests, if required.

Reference:

- Procedure 14-9: “Perform DS1/E1 transmission test” (p. 14-69)
- Procedure 14-10: “Perform DS3 transmission test” (p. 14-76)
- Procedure 14-11: “Perform EC-1 transmission test” (p. 14-82)

8 Test protection switching function, if required.

Reference: Procedure 14-12: “Test function unit equipment protection switching” (p. 14-88)

9 Activate remaining optional features as required.

Reference:

- Chapter 6, “System configuration procedures”
- Chapter 7, “System administration procedures”
- Chapter 8, “System performance monitoring procedures”
- Appendix A, “Provisionable parameters”

10 The network is ready for service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

4 Install and provision circuit packs/OLIUs procedures

Overview

Purpose

This chapter includes procedures necessary to install and provision circuit packs and OLIUs in Alcatel-Lucent 1665 DMX.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedure, that additional equipment is listed in that procedure.

Procedure 4-1: Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf

Overview

Use this procedure to install a factory-fresh SYSCTL (LNW2) in a new Alcatel-Lucent 1665 DMX shelf (no circuit packs installed).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to "Required equipment" (p. 4-3) listed in this chapter, a factory-fresh LNW2, system controller (SYSCTL), with two non-volatile memory (NVM) cards installed is also required.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to install the LNW2 SYSCTL in a new shelf without other circuit packs installed.

1 **Important!** For software installation, both NVMs must be present in the LNW2 SYSCTL.

After the LNW2 is installed, if one or both NVMs are missing, `NVM removed` alarm(s) are issued and:

- If one NVM socket is empty or an NVM is failed, the **IND** displays an alternating **N** and **O** and **x** (x=1 or 2, indicating the offending NVM socket).
- If both NVM sockets are empty, the **IND** displays an alternating **E** and **0** and **1**.

Refer to Step 2 for the complete listing of codes.

Insert the LNW2 (SYSCTL) circuit pack into the slot labeled **CTL** in the center of the shelf using a steady pressure on both faceplate latches. Allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 10 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and then **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.
4. Continue with Step 2.

2 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
nothing	Software is installed on the SYSCTL. Proceed to Procedure 14-14: "Retrieve software generic release and database information" (p. 14-92).
alternating **M** and **P** and **9** and "**.**" (" **.**" is a red, four-segment square [2 x 2] representing a period) and **1**	9.1 Maintenance Mode. Proceed to Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31).
alternating **M** and **P** and **9** and "**.**" (" **.**" is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Proceed to Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31).
alternating **M** and **P** and **8**and "**.**" (" **.**" is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Proceed to Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31).
alternating **M** and **P** and **7** and "**.**" (" **.**" is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Proceed to Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31).
alternating **M** and **P** and **6** and "**.**" (" **.**" is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Proceed to Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31).

If...	Then...
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **1** and **0**	LNW2 SYSCTL will not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.
alternating **N** and **O** and **x**	"x" indicates that the NVM socket (1 or 2) is empty of the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
Letter **U**	LNW2 SYSCTL will not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

END OF STEPS

Procedure 4-2: Install OLIU circuit packs in Main slots

Overview

Use this procedure to install OLIU circuit packs in the Main slots.

Important! The OLIU circuit packs in the Main slots *must* both have the same optical line rate and VT cross-connect size. If the circuit packs in the Main slots have different optical line rates or VT cross-connect sizes, the system reports an `unexpected CP type` alarm and service may be impacted.

If installing LNW80 Switch circuit packs in the Main slots, refer to Procedure 4-16: "Install LNW80 switch pack" (p. 4-101).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 4-3), the following equipment is also required:

- Erasable marker or pencil
- Optical loopback cables, LBOs, and optical fiber cleaning tools (if loopbacks are performed)
- A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW82 OC3/OC12/OC48 and LNW504 OC-48/OC-192 circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Use only Alcatel-Lucent Approved Class 1 SFP/XFP transceivers. Refer to the list of pluggable transmission modules in Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

3. Obtain the work instructions for this procedure. It is especially important to know desired wavelengths and enhanced mode requirements (12 STS-1s) when applicable.
4. Ensure that correct OLIU circuit packs are available for installation.

   The OLIU circuit packs in Main slots *must* have the same size VT cross-connect fabric. For example, the LNW27 and LNW29 OC-48 OLIU circuit packs have full (up to 48 STS-1s) VT mapping; therefore, they can be used together in the Main slots. If the circuit packs in the Main slots have different VT cross-connect fabric sizes, the system reports an `unexpected CP type` alarm.

   The following is a list of Main OLIU circuit packs grouped by switch fabric:

   - OC-12 OLIUs with 12 STS-1 switch fabric: LNW48 LNW50 LNW54 LNW203
   - OC-48 OLIUs with 12 STS-1 switch fabric: LNW26B (jumper set to enhanced) LNW28 (jumper set to enhanced) LNW77 (jumper set to enhanced) LNW121B–LNW159B (jumper set to enhanced)

     LNW26B, LNW28, LNW77, LNW121B–LNW159B OC-48 OLIUs with 6 STS-1 switch fabric (jumper set to normal) are not supported in Release 6.0.

     The LNW26B, LNW28, LNW77, and LNW121B–159B OLIU circuit packs are DA'ed and are no longer available.
   - OC-48 OLIUs with 48 STS-1 switch fabric: LNW27 LNW29 LNW32 LNW76 LNW202 LNW221–LNW259.

     LNW221–LNW259 are DA'd and are no longer available
   - OC-192 OLIUs with 48 STS-1 switch fabric: LNW56 LNW57 LNW58 LNW60 LNW502 LNW523 LNW527 LNW554 LNW555

     The LNW523 LNW527 LNW554 LNW555 are DA'd and are no longer available
   - Very Large Fabric multiport OC-192 OLIUs with 576 STS-1 switch fabric: LNW59
   - Very Large Fabric multiport multirate OC3/OC12/OC48 OLIUs with 192 STS-1 switch fabric: LNW82
   - Very Large Fabric multipor, multirate OC48/OC192 OLIUs with 576 STS-1 switch fabric: LNW504

   Important! The Very Large Fabric LNW59, LNW82, and LNW504 circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The Standard Alcatel-Lucent 1665 DMX Shelf does not support LNW59, LNW82, and LNW504 circuit packs. If LNW59, LNW82, and LNW504 circuit packs are installed in the Standard Alcatel-Lucent 1665 DMX Shelf, the system will not recognize the circuit pack as an allowable type.

   To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Steps

Complete the following steps to install OLIU circuit packs in the Main slots.

1 Are you installing an LNW121B–159B or LNW221–259 OLIU circuit pack?

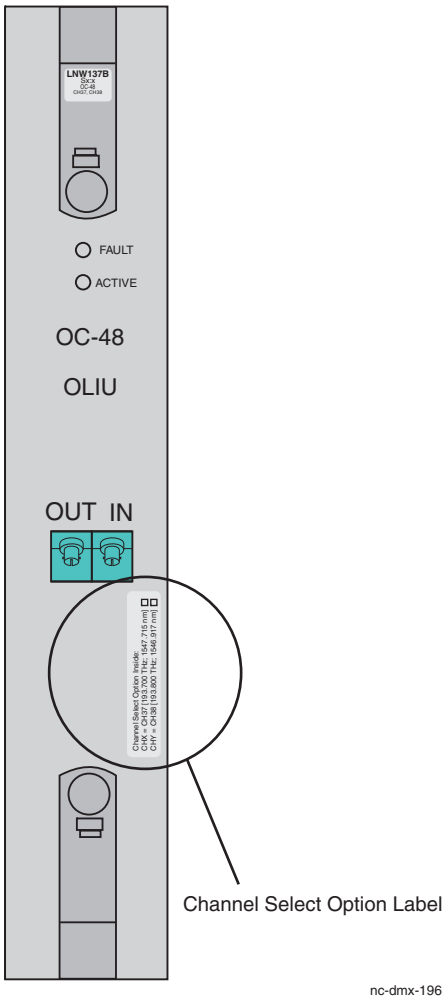
If...	Then...
Yes	Continue with Step 2.
No	Proceed to Step 5.

Note: The LNW121B–159B and LNW221–LNW259 OLIU circuit packs are DA'ed and are no longer available.

2 From your work orders, determine the wavelength that you wish to set on the LNW121B–LNW159B or LNW221–LNW259 circuit pack. Use the Channel Select Option Label on the faceplate of the circuit pack to determine the correct channel.

For example, the Channel Select Option Label on the faceplate of the LNW137B circuit pack in Figure 4-1, "Channel select option label on LNW137B" (p. 4-10) shows that CH X must selected if CH37 (193.700 THz; 1547.715 nm) is desired.

Figure 4-1 Channel select option label on LNW137B



3 If you are installing an:

- LNW121B–159B, refer to Figure 4-2, “Jumper settings for LNW121B–159B” (p. 4-11)
  - Set the channel selection jumper on your circuit pack to either **CH X** or **CH Y** for your desired wavelength/channel.
  - Set the enhanced/normal jumper on your circuit pack to **Enhanced** (switch fabric can cross-connect VT across any 12 STS-1s). **Normal** (switch fabric can cross-connect VT across any 6 STS-1s) is not supported in Release 6.0.

  LNW221–259, refer to Figure 4-3, “Jumper settings for LNW221–259” (p. 4-12)
  - Set the channel selection jumper on your circuit pack to either **CH X** or **CH Y** for your desired wavelength/channel.

Figure 4-2 Jumper settings for LNW121B-159B

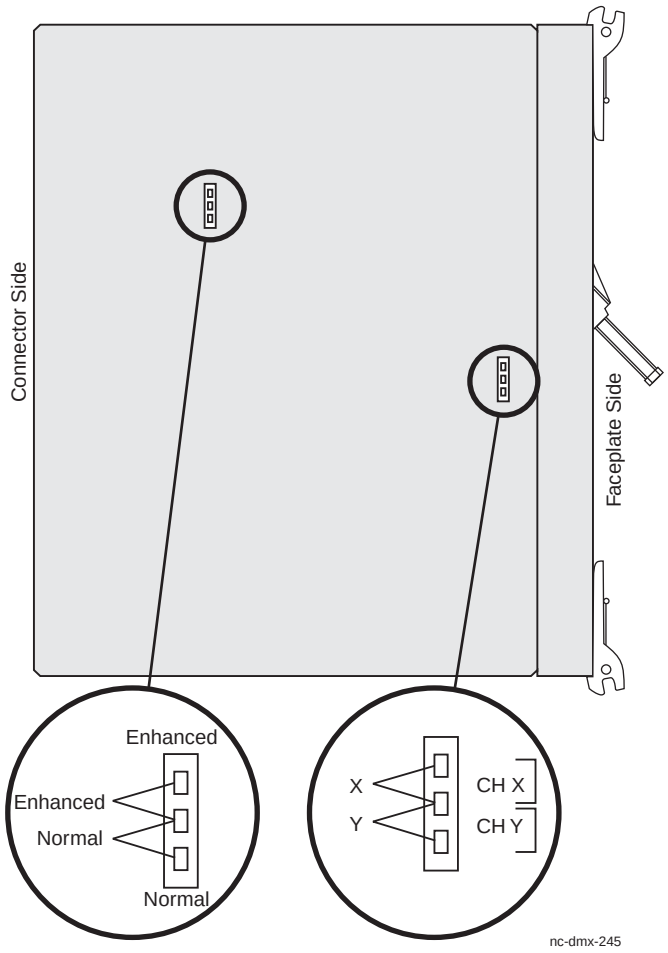
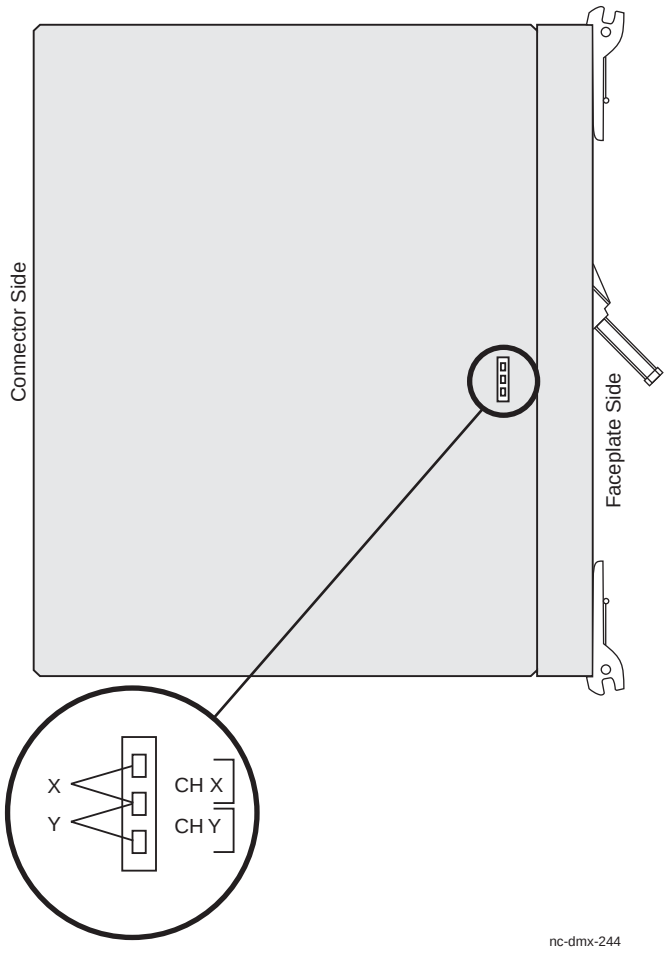


Figure 4-3 Jumper settings for LNW221-259



4 Using an erasable marker or pencil, check the appropriate box on the Channel Select Option Label, refer to Figure 4-1, "Channel select option label on LNW137B" (p. 4-10), that corresponds to your jumper setting.

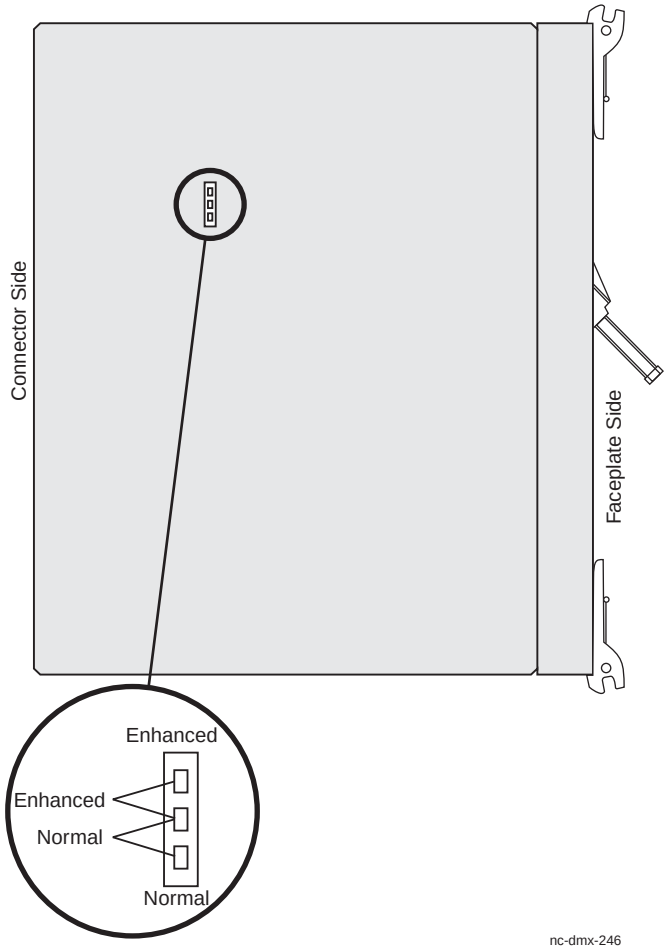
Important! This label is the only means available to identify the wavelength selected when the pack is fully seated and/or in-service.

5 Are you installing an LNW26B, LNW28, LNW77, LNW121B–159B OLIU circuit pack?

If...	Then...
Yes	Continue with Step 6.
No	Proceed to Step 7.

6 Set the enhanced/normal jumper on your circuit pack to **Enhanced** (switch fabric can cross-connect VT across any 12 STS-1s). **Normal** (switch fabric can cross-connect VT across any 6 STS-1s) is not supported in Release 6.0. Refer to Figure 4-4, "Jumper settings for enhanced mode" (p. 4-13).

Figure 4-4 Jumper settings for enhanced mode



7 Ensure all optical fiber connectors and couplings are properly cleaned.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

8 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the pluggable transmission module(s).

Reference: Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

9 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW82 OC3/OC12/OC48 and LNW504 OC-48/OC-192 circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

If required, verify that the shelf is equipped with the deeper shelf cover and carefully remove any caution tags that are attached to the LNW82 or LNW504 circuit pack.

10 Seat the first OLIU circuit pack in Main slot **M1** by applying steady pressure to both faceplate latches.

Result: For non-VLF OLIU circuit packs, the **FAULT** LED lights for approximately 20 seconds then goes off, indicating successful installation.

For VLF OLIU circuit packs, the **FAULT** LED lights for approximately 10 minutes then goes off, indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

If response is not correct, replace the OLIU circuit pack. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

11 Seat the second OLIU circuit pack in Main slot **M2** by applying steady pressure to both faceplate latches.

Result: For non-VLF OLIU circuit packs, the **FAULT** LED lights for approximately 20 seconds then goes off, indicating successful installation.

For VLF OLIU circuit packs, the **FAULT** LED lights for approximately 10 minutes then goes off, indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

If response is not correct, replace the OLIU circuit pack. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

12 **Important!** The LNW59 OC-192 OLIU circuit pack may be equipped with up to two pluggable transmission modules. However, pluggable transmission modules are *not* required when the LNW59 OC-192 OLIU circuit pack is used in headless, optics-free, switch applications.

The LNW82 OLIU circuit pack may be equipped with a mix of up to eight OC-3/12/48 pluggable transmission modules. However, pluggable transmission modules are *not* required when the LNW82 OLIU circuit pack is used in headless, optics-free, switch applications.

The LNW504 OLIU circuit pack may be equipped with up to four OC-192 pluggable transmission modules or up to three OC–192 pluggable transmission modules and up to four OC-48 pluggable transmission modules. However, pluggable transmission modules are *not* required when the LNW504 OLIU circuit pack is used in headless, optics-free, switch applications.

The LNW202 OC-48, LNW203 OC-12, and LNW502 OC-192 OLIU circuit packs may be equipped with one pluggable transmission module.

If required, install pluggable transmission modules.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

13

If optical port testing is...	Then...
required and has not already been performed,	Determine the optical port to be tested and continue with Step 14.
not required or has already been performed,	Proceed to Step 20.

14 **Important!** If the port Signal Type parameter is STNA (Signal Type Not Available) for a port on an LNW82 or LNW504 multirate OLIU circuit pack, then the port is not usable and cannot be tested.

Select **Configuration** → **DCC Terminations** to access the required usable optical port on the installed OLIU circuit pack and provision *OSI over DCC* as **disabled** to prevent DCC-related alarms. Click **Apply** and **Close**.

15 Loop back the required optical port on the installed OLIU circuit pack to test port functionality.

Reference: Procedure 14-6: "Connect OLIU optical loopbacks" (p. 14-58)

16 Remove the lightguide jumper used to loop back the port and the LBO, if required.

Result: The OLIU **FAULT** LED and the port LED associated with the pluggable transmission module starts flashing. The **MN** and **NE** LEDs are lighted on the SYSCTL circuit pack.

17 From the System View window, click the **Alarm List** button to obtain the *NE Alarm List* and verify that the alarm is associated with the port being tested.

18 **Important!** It is recommended that the dust cover be installed into the optical ports on the pluggable transmission module to maintain cleanliness until the optical fiber is connected.

If required, reinstall the dust cover into the optical ports on the pluggable transmission module to maintain cleanliness.

19 Select **Configuration** → **Update System** → **Update All** to clear the incoming signal alarms.

Result: The OLIU **FAULT** LED and the port LED associated with the pluggable transmission module stops flashing. All alarms are cleared.

If required, repeat Step 14 through Step 19 to test all usable optical ports on the OLIU circuit packs just installed.

20 From the System View window, click the **Alarm List** button to obtain the *NE Alarm List*. Verify that no alarms, protection switches, protection switch lockouts, and loopbacks are present for the ports on the OLIU circuit packs just installed.

Result: No alarms should be present for the OLIU circuit packs just installed.

21 If required at this time, provision the circuit pack and/or port parameters.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

END OF STEPS

Procedure 4-3: Install OLIU circuit packs in Function slots

Overview

Use this procedure to install the following OLIU circuit packs in Function/Growth slots A1/A2, B1/B2, C1/C2, D1/D2, and G1/G2.

- LNW31 OC-48 OLIU
- LNW36 OC-3 OLIU
  The LNW36 is DA'd and is no longer available
- LNW37 4OC-3 OLIU with up to four pluggable transmission modules
  The LNW37 is DA'd and is no longer available
- LNW45 8OC-3 OLIU with up to eight pluggable transmission modules
- LNW46 OC-12 OLIU
- LNW49 4OC-12 OLIU with up to four pluggable transmission modules
- LNW55 OC3/OC12/OC48 OLIU with up to twelve pluggable transmission modules
- LNW62 4OC-48 OLIU with up to four pluggable transmission modules
- LNW402 OC-48 OLIU with one pluggable transmission module
- LNW421–LNW459 OC-48 PWDM OLIU
  The LNW421, LNW423, LNW431, LNW433, LNW435, LNW437, LNW443, LNW445, and LNW457 circuit packs are DA'ed and are no longer available.
- LNW603 OC-192 OLIU with one pluggable transmission module

  Important! If installing LNW55, LNW62, and/or LNW603 OLIU circuit packs, the Main slots must be equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs. If the Main slots are not equipped with Very Large Fabric OLIU circuit packs, the system reports a `CP not allowed - eqpt` alarm.

  Important! A maximum equivalent of 24 2-way STS-1 cross-connections is supported on OC-N low-speed OLIUs in Function Groups A, B or C, when the Main slots are equipped with LNW26B, LNW28, LNW77, and LNW121B–159B OC-48 OLIUs, or with LNW48, LNW50, and LNW203 OC-12 OLIUs.

  For detailed information about cross-connections and restrictions regarding circuit pack types, rates, and VT granularity, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*.

Equipage guidelines (Main slots not equipped with Very Large Fabric OLIU circuit packs)

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the OLIU circuit packs in a Function/Growth group *must* both have the same optical line rate and VT cross-connect size. For example, the LNW36 and LNW37 OC-3 OLIU circuit packs have the same optical line rate (OC-3) and VT cross-connect fabric size (up to 12 STS-1s); therefore, they can be used together in the

same Function/Growth group. If the circuit packs in a Function/Growth group have different optical line rates or VT cross-connect sizes, the system reports an `unexpected CP type` alarm and service may be impacted.

The following is a list of compatible low-speed OLIU circuit packs grouped by optical line rate and switch fabric size:

- OC-3 OLIUs with 12 STS-1 switch fabric: LNW36, LNW37
- OC-3 OLIUs with 48 STS-1 switch fabric: LNW45
- OC-12 OLIUs with 12 STS-1 switch fabric: LNW46
- OC-12 OLIUs with 48 STS-1 switch fabric: LNW49
- OC-48 OLIUs with 12 STS-1 switch fabric: LNW31, LNW402, LNW421–LNW459
  The LNW421, LNW423, LNW431, LNW433, LNW435, LNW437, LNW443, LNW445, and LNW457 circuit packs are DA'ed and are no longer available.
- Very Large Fabric OC-192 OLIUs with 192 STS-1 switch fabric: LNW603

Equipage guidelines (Main slots equipped with Very Large Fabric OLIU circuit packs)

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group may be the same or different circuit pack type depending on the Slot Protection State.

If the Slot Protection State is Protected, the OLIU circuit packs/ports in a Function/Growth group *must* both have the same optical line rate and VT cross-connect size. When any OLIU circuit pack, except an LNW55 OLIU circuit pack, is installed in an unprovisioned Function/Growth group, the default Slot Protection State is Protected. When an LNW55 OLIU circuit pack is installed in an unprovisioned Function/Growth group, the default Slot Protection State is Unprotected.

If the Slot Protection State is Unprotected, the circuit packs within the Function/Growth group may be different circuit pack types. The default Slot Protection State is Unprotected when an OLIU circuit pack is installed in a Function/Growth group with an unprotected circuit pack.

The following combinations of 0x1 compatible circuit pack types are supported in Function/Growth Slot 1 and Slot 2 when the Slot Protection State is Unprotected.

Slot 2	Slot 1			
	LNW66/LNW71	LNW74 (S1:2 and later)	LNW70 (S1:3 and later)/ LNW78	Other Front Access Circuit Packs (Note 1)
LNW66/LNW71	Not compatible	Not compatible	Not compatible	Compatible
LNW74 (S1:2 and later)	Not compatible	Compatible (Note 2)	Compatible	Compatible

Slot 2	Slot 1			
	LNW66/LNW71	**LNW74 (S1:2 and later)**	**LNW70 (S1:3 and later)/ LNW78**	**Other Front Access Circuit Packs (Note 1)**
LNW70 (S1:3 and later)/ LNW78	Not compatible	Compatible	Compatible	Compatible
Other Front Access Circuit Packs (Note 1)	Compatible	Compatible	Compatible	Compatible
Note 1: This includes the LNW63, LNW64, LNW67, LNW68, LNW73/73C, LNW87, LNW170, LNW705, LNW785, and all low-speed OLIU circuit packs. The LNW6, LNW7, LNW8, LNW16, LNW18, LNW19/19B, LNW20, LNW70 (S1:2 and earlier), LNW74 (S1:1), and LNW801 are not 0x1 compatible. Note 2: The circuit pack Ethernet Mode parameter must be provisioned as FX to support LNW74 circuit packs in slot 1 and slot 2; otherwise, this configuration is incompatible.				

If an incompatible circuit pack is installed in a Function/Growth slot, the system reports a `CP not allowed - eqpt` alarm.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

The Slot Protection State parameter can be changed from Protected to Unprotected or from Unprotected to Protected. If required, refer to Procedure 4-24: “Change slot protection state” (p. 4-125).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

In addition to the equipment listed in “Required equipment” (p. 4-3), an erasable marker or pencil is required.

Use only Alcatel-Lucent Approved Class 1 SFP transceivers. Refer to the list of pluggable transmission modules in Procedure 4-15: “Install pluggable transmission modules” (p. 4-76).

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48 circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain work instructions for this procedure.
4. Ensure that the correct OLIU circuit pack(s) and pluggable transmission modules (if required) are available for installation.
5. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install OLIU circuit packs in Function/Growth slots (A1/A2, B1/B2, C1/C2, D1/D2, G1/G2).

1 Determine the Function/Growth slot(s) being equipped with OLIU circuit packs.

Reference:

- "Equipage guidelines (Main slots not equipped with Very Large Fabric OLIU circuit packs)" (p. 4-17)
- "Equipage guidelines (Main slots equipped with Very Large Fabric OLIU circuit packs)" (p. 4-18)

2 Ensure all optical fiber connectors and couplings are properly cleaned.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

3 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the optical pluggable transmission module(s).

Reference: Procedure 14-29: “Clean optical pluggable transmission module” (p. 14-141)

4 **Important!** The LNW421, LNW423, LNW431, LNW433, LNW435, LNW437, LNW443, LNW445, and LNW457 circuit packs are DA’ed and are no longer available.

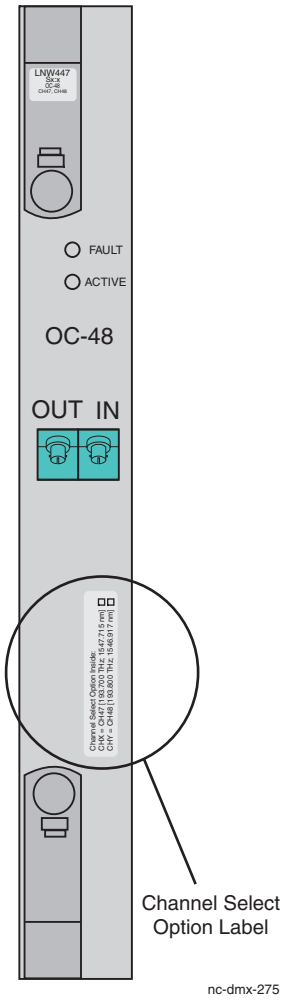
Are you installing an LNW421–LNW459 OLIU circuit pack?

If…	Then…
Yes	Continue with Step 5.
No	Proceed to Step 8.

5 From your work orders, determine the wavelength that you wish to set on the LNW421–LNW459 circuit pack. Use the Channel Select Option Label on the faceplate of the circuit pack to determine the correct channel.

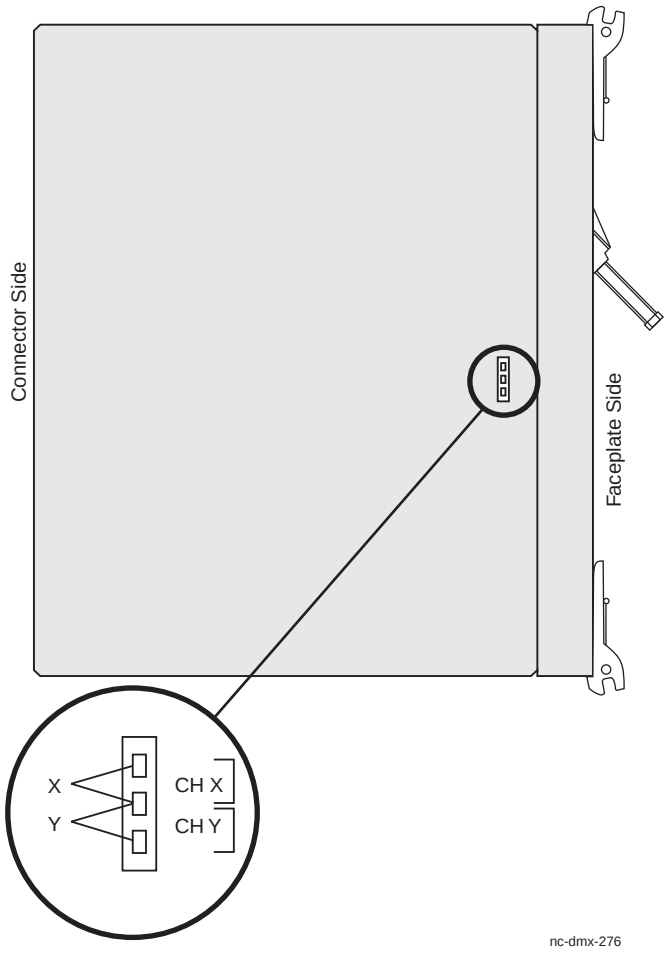
Example From the Channel Select Option Label on the faceplate of the LNW447, refer to Figure 4-5, "Channel select option label on LNW447" (p. 4-22), we determine that for the desired CH47 wavelength, we must select CH X.

Figure 4-5 Channel select option label on LNW447



6 Set the channel selection jumper on your circuit pack to either **CH X** or **CH Y** for your desired wavelength/channel, refer to Figure 4-6, "Jumper settings for LNW421–LNW459" (p. 4-23).

Figure 4-6 Jumper settings for LNW421-LNW459



7 Using an erasable marker or pencil, check the appropriate box on the Channel Select Option Label, refer to Figure 4-5, “Channel select option label on LNW447” (p. 4-22), that corresponds to your jumper setting.

Important! This label is the only means available to identify the wavelength selected when the pack is fully seated and/or in-service.

8 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48 circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

If required, verify that the shelf is equipped with the deeper shelf cover and carefully remove any caution tags that are attached to the LNW55 circuit pack.

9 Open both faceplate latches and seat the OLIU circuit pack into the required Function/Growth slot by applying steady pressure to both faceplate latches.

Result: For LNW55 OC3/OC12/OC48, LNW62 4OC-48, and LNW603 OLIU circuit packs, the **FAULT** LED lights for approximately 10 minutes then goes off, indicating successful installation.

For all other low-speed OLIU circuit packs, the **FAULT** LED lights for approximately 15 seconds then goes off, indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

If response is not correct, replace the OLIU circuit pack. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* for more information.

10 **Important!** The LNW37 4OC-3 and LNW49 4OC-12 OLIU circuit packs may be equipped with up to four pluggable transmission modules. The LNW45 8OC-3 OLIU circuit packs may be equipped with up to eight pluggable transmission modules.

The LNW55 OC3/OC12/OC48 OLIU circuit packs may be equipped with a mix of up to twelve OC-3/12/48 pluggable transmission modules.

The LNW62 4OC-48 OLIU circuit packs may be equipped with up to four pluggable transmission modules.

The LNW402 OC-48 OLIU circuit packs may be equipped with one pluggable transmission module.

The LNW603 OC-192 OLIU circuit packs may be equipped with one pluggable transmission module.

If required, install pluggable transmission module(s).

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

11

If optical port testing is...	Then...
required and has not already been performed,	Determine the optical port to be tested and continue with Step 12.
not required or has already been performed,	Proceed to Step 18.

12 **Important!** If the port Signal Type parameter is STNA (Signal Type Not Available) for a port on an LNW55 multirate OLIU circuit pack, then the port is not usable and cannot be tested.

Select **Configuration** → **DCC Terminations** to access the required usable optical port on the installed OLIU circuit pack and provision *OSI over DCC* as **disabled** to prevent DCC-related alarms. Click **Apply** and **Close**.

13 Loop back the required optical port on the installed OLIU circuit pack to test port functionality.

Reference: Procedure 14-6: "Connect OLIU optical loopbacks" (p. 14-58)

14 Remove the lightguide jumper used to loop back the port and the LBO, if required.

Result: The OLIU **FAULT** LED and the port LED associated with the pluggable transmission module starts flashing. The **MN** and **NE** LEDs are lighted on the SYSCTL circuit pack.

15 From the System View window, click the **Alarm List** button to obtain the *NE Alarm List* and verify that the alarm is associated with the port being tested.

16 **Important!** It is recommended that the dust cover be installed into the optical ports on the pluggable transmission module to maintain cleanliness until the optical fiber is connected.

If required, reinstall the dust cover into the optical ports on the pluggable transmission module to maintain cleanliness.

17 From the System View window, select **Configuration** → **Update System** → **Update All**.

Result: The OLIU **FAULT** LED and the port LED associated with the pluggable transmission module stops flashing. All alarms are cleared.

Repeat Step 12 through Step 17 to test all usable optical ports on the OLIU circuit pack just installed.

18 Is a second OLIU circuit pack required in the companion Function/Growth slot?

If...	Then...
Yes	Repeat this procedure from Step 1 to install the second OLIU circuit pack in the companion Function/Growth slot.
No	Verify that the companion Function/Growth slot is equipped with a circuit pack, 177D Application Blank, or LNW98 Detectable Blank circuit pack. If the companion Function/Growth slot is unequipped, insert a 177D Application Blank or LNW98 Detectable Blank circuit pack into the slot. If an LNW98 Detectable Blank circuit pack was installed, select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

19 From the System View window, click the **Alarm List** button to obtain the *NE Alarm List*. Verify that no alarms, protection switches, protection switch lockouts, and loopbacks are present for the ports on the OLIU circuit packs just installed.

Result: No alarms should be present for the OLIU circuit packs just installed.

20 If required at this time, provision the circuit pack and/or port parameters.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

END OF STEPS

Procedure 4-4: Provision OLIU circuit packs/ports for service

Overview

Use this procedure to provision OLIU circuit packs/ports for service.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Ensure appropriate OLIU circuit pack(s) is installed. If required, refer to Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7) and/or Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17).

Steps

Complete the following steps to provision OLIU circuit packs/ports for service.

1 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the OLIU circuit packs/ports to be provisioned.

Result: The *NE Alarm List* appears.

2 **Important!** The default Slot Protection State is Unprotected when an LNW55 OLIU circuit pack is installed in an unprovisioned Function/Growth group since the default port Signal Type is STNA (signal type not available). For all other OLIU circuit packs installed in an unprovisioned Function/Growth group, the default Slot Protection State is Protected.

The default Slot Protection State is Unprotected when an OLIU circuit pack is installed in a Function/Growth group with an unprotected circuit pack.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

If required, change the Slot Protection State.

Reference: Procedure 4-24: "Change slot protection state" (p. 4-125)

3 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

4 Find and highlight the OLIU circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

5 **Important!** If one or more ports on a low-speed OLIU circuit pack are to carry SDH signals, the **SS Bits** parameter *must* be provisioned **SS10** to interwork with older SDH network elements. Newer SDH network elements ignore SS bits. The provisioned value of the SS Bits parameter has no effect on SONET signals or network elements that carry SONET signals.

The **SS Bits** parameter may be provisioned for individual ports on LNW55, LNW59, LNW62, LNW82, LNW504, and LNW603 OLIU circuit packs.

Provision the required circuit pack parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, go to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** to apply the changes.

6 If required, repeat Step 4 and Step 5 to provision the companion circuit pack parameters.

7 Click **Close** to exit or continue with the next step to provision a port(s).

8 **Important!** If the port Signal Type parameter is STNA (default value) for a port on an LNW55, LNW82, or LNW504 multirate OLIU circuit pack, the Signal Type parameter must be changed to another value before other port parameter changes are allowed.

Changing port and socket parameters is not allowed until the Signal Type parameter is changed. If the port Signal Type parameter is STNA and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

If ...	Then...
Changing an LNW55, LNW82, or LNW504 port Signal Type parameter from STNA to another value,	Continue with the next step.
Not changing an LNW55, LNW82, or LNW504 port Signal Type parameter from STNA to another value,	Proceed to Step 14.

9 Find the OLIU circuit pack with the ports being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the OLIU circuit pack.

10 Click (highlight) the OLIU port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear.

11 **Important!** When the Signal Type parameter is initially changed from STNA to another value the change may be applied to *This Port* only or *All Ports, This Pack*.

Provision the Signal Type parameter according to the work instructions and click **Apply** to make provisioning changes.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

12 **Important!** When the Signal Type parameter is initially changed from STNA to another value, 0x1 is the default and only selectable value for the Application parameter. The protected applications (for example, 1+1 and UPSR) are only valid/selectable after the Signal Type parameter is provisioned to the same value for both companion ports on the circuit packs in slot 1 and slot 2.

If required, repeat Step 9 through Step 11 to provision the Signal Type parameter the same value for the companion port.

13 Click **Close** to exit or continue with the next step to perform additional port provisioning.

14 If required, install pluggable transmission modules.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

15 Find the OLIU circuit pack with the ports being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the OLIU circuit pack.

16

If the circuit pack is...	Then...
equipped with pluggable transmission modules,	Perform the following: 1. Click (highlight) the required pluggable transmission module (PTM) being provisioned, then click **Select** at the bottom of the window. 2. Provision the required pluggable transmission module parameters according to the work instructions, then click **Apply** if changes were made. If required, repeat this step to access and provision the companion pluggable transmission module. Then continue with Step 17.
not equipped with pluggable transmission modules,	continue with Step 17.

17 Click (highlight) the OLIU port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear.

18 **Important!** The port Application parameter may be changed from 1+1 to 1+1 Bidirectional or from 1+1 Bidirectional to 1+1 when cross-connections exist on the line pair.

Select and provision the required port parameters, according to the work instructions.

19 If required, provision unprotected operation for an optical port.

Reference: Procedure 4-5: "Provision unprotected operation on optical ports" (p. 4-32)

20 If required, provision J0 section trace for an optical port.

Reference: Procedure 6-13: "Provision J0 section trace" (p. 6-47)

21 If required, provision the port control plane parameters.

Reference: Procedure 9-13: "Establish external network-to-network interface (E-NNI)" (p. 9-154)

22 **Important!** The provisioning changes may be applied to *This Port* only or *Port Pair*. The *Port Pair* option only appears after the Signal Type parameter has been provisioned to an OC-n value.

All the current parameter settings may be applied to both ports of a port pair, or only the parameter settings that changed may be applied to both ports of a port pair.

If required, select *Port Pair* in the **Apply to:** field to apply the current parameter settings to both ports of the port pair or only the parameter settings that changed.

23 Click **Apply** to make provisioning changes. If no changes were made, continue with the next step.

Result: If *Port Pair* was selected in the **Apply to:** field, a dialog box appears asking if you want to apply all parameter settings on the screen. Click **Yes** or **No** as required.

A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

24 If required, repeat this procedure from Step 8 to provision additional ports on the OLIU circuit pack.

25 If required, repeat this procedure from Step 4 to provision additional OLIU circuit packs; otherwise, click **Close** to exit.

END OF STEPS

Procedure 4-5: Provision unprotected operation on optical ports

Overview

Use this procedure to perform the following:

- Provision unprotected operation for low-speed optical ports when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.
- Change pre Release 5.0 unprotected application to 0x1S1 or 0x1S2 application when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.
- Provision unprotected operation for low-speed and high-speed optical ports when the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Unprotected operation when Main slots not equipped with Very Large Fabric circuit packs

When the Main slots are not equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the 1+1, Bidirectional 1+1, Optimized 1+1, UPSR, BLSR, and 0x1Sn unprotected applications may be mixed between port pairs of a Function group. *For example*, a Function group may have a 1+1 application on a port pair, a UPSR application on a port pair, and/or an unprotected application on a single port of a port pair.

However, two separate unprotected applications are *not* allowed on the same port pair of a Function group. *For example*, a Function group does *not* support an unprotected application on port 3 of the primary circuit pack and another unprotected application on port 3 of the protection circuit pack. However, a Function group does support an unprotected application on port 3 of the primary circuit pack and another unprotected application on port 4 of the protection circuit pack.

Unprotected operation when Main slots equipped with Very Large Fabric circuit packs

When the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the 1+1, Bidirectional 1+1, Optimized 1+1, UPSR, BLSR, and 0x1 unprotected applications may be mixed between port pairs.*For example*, a Function group may have a 1+1 application on a port pair, a UPSR application on a port pair, and/or one or two unprotected 0x1 applications on a port pair.

When the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, two separate unprotected 0x1 applications are allowed on the same port pair. *For example*, a Function group supports an unprotected 0x1 application on port 3 of the primary circuit pack and another separate unprotected 0x1 application on port 3 of the protection circuit pack.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the required slots, circuit packs, and ports, and specify parameters/values to be provisioned.
5. Verify that the slots have been equipped with circuit packs and any required pluggable transmission modules have been installed.

Steps

Complete the following steps to provision unprotected optical ports.

1

If...	Then proceed to...
Provisioning unprotected operation for low-speed optical ports when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs,	Procedure 4-5.1: "Provision unprotected operation for low-speed optical ports (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-34).
Changing an existing unprotected 1+1, Bidirectional 1+1, Optimized 1+1, or UPSR application to an 0x1S1 or 0x1S2 application when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs,	Procedure 4-5.2: "Change pre Release 5.0 unprotected application to 0x1S1 or 0x1S2 application (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-36).
Provisioning unprotected operation for low-speed or high-speed optical ports when the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs,	Procedure 4-5.3: "Provision unprotected operation for optical ports (Main slots equipped with Very Large Fabric circuit packs)" (p. 4-38).

END OF STEPS

Procedure 4-5.1: Provision unprotected operation for low-speed optical ports (Main slots not equipped with Very Large Fabric circuit packs)

Overview

Use this procedure to initially provision unprotected operation for low-speed optical ports when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to provision unprotected operation for low-speed optical ports when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Find the low-speed OLIU circuit pack with the port being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the low-speed OLIU circuit pack.

3 Click (highlight) the OLIU port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear on the right side of the window.

4 Provision the Application parameter (**0x1S1** or **0x1S2**) according to your work instructions.

If the port being provisioned is in slot 1, choose **0x1S1**. For a port in slot 2, choose **0x1S2**.

5 Provision the Port Monitoring Mode parameter for the selected port as **AUTO**.

6 Click **Apply** and **Close**.

Important! If a companion port is equipped for the port being provisioned, the port state for the companion port is automatically set to Not Monitored (NMON) and is *not* provisionable. The inactive companion port, if equipped, transmits the system idle signal (STS UNEQ-P or AIS-P) on all tributaries.

7 If required, repeat this procedure to provision other low-speed optical ports.

When a port is ready to be cross-connected, select **Configuration** → **Cross-Connections** from the System View. Use the Cross-Connection Wizard to provision the cross-connections.

Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit packs for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

Reference:

- Chapter 10, "TDM service provisioning procedures"
- Chapter 11, "Ethernet/Data network provisioning procedures"

END OF STEPS

Procedure 4-5.2: Change pre Release 5.0 unprotected application to 0x1S1 or 0x1S2 application (Main slots not equipped with Very Large Fabric circuit packs)

Overview

Use this procedure to change an existing unprotected 1+1, Bidirectional 1+1, Optimized 1+1, or UPSR application to an 0x1S1 or 0x1S2 application when the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

This procedure allows you to change an existing unprotected application, implemented using prescribed methods prior to Release 5.0, to an 0x1S1 or 0x1S2 application.

Before you begin

Existing 1+1, Bidirectional 1+1, Optimized 1+1, or UPSR applications may be changed to 0x1S1 or 0x1S2 applications if the following conditions are met:

- There are no cross-connections to UPSR ring channels. Cross-connections on 0x1Sn ports are provisioned only with channel aids.
- There are no unswitched cross-connections on UPSR ports. Unswitched cross-connections are not supported on 0x1Sn ports.
- Service for all provisioned cross-connections on the port(s) is carried on the port in slot n.

Steps

Complete the following steps to change provisioning for the required port.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Find the low-speed OLIU circuit pack with the port being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the low-speed OLIU circuit pack.

3 Click (highlight) the OLIU port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters display on the right side of the window.

4 Provision the Application parameter according to the work instructions. Select **0x1S1** for a port in slot 1 or **0x1S2** for a port in slot 2.

5 Provision the Port Monitoring Mode parameter as **AUTO**.

6 Click **Apply** and **Close**.

Important! If a companion port is equipped for the port being provisioned, the port state for the companion port is automatically set to Not Monitored (NMON) and is *not* provisionable. The inactive companion port, if equipped, transmits the system idle signal (STS UNEQ-P or AIS-P) on all tributaries.

7 If required, repeat this procedure to change the provisioning for other low-speed optical ports.

END OF STEPS

Procedure 4-5.3: Provision unprotected operation for optical ports (Main slots equipped with Very Large Fabric circuit packs)

Overview

Use this procedure to provision unprotected operation for low-speed and high-speed optical ports when the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to provision unprotected operation for low-speed and high-speed optical ports when the Main slots are equipped with Very Large Fabric OLIU circuit packs.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Find the OLIU circuit pack with the port being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the OLIU circuit pack.

3 Click (highlight) the OLIU port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters display on the right side of the window.

4 **Important!** If provisioning a port on an LNW55, LNW82, or LNW504 multirate OLIU circuit pack and the port Signal Type parameter is STNA (default value), the Signal Type parameter must be changed to another value before other port parameter changes are allowed.

If required, provision the Signal Type parameter to the required OC-n rate and click **Apply**; otherwise, continue with the next step.

5 Provision the Application parameter **0x1**.

6 Provision the Port Monitoring Mode parameter for the selected port as **AUTO**.

7 Click **Apply** and **Close**.

8 If required, repeat this procedure to provision other optical ports.

When a port is ready to be cross-connected, select **Configuration** → **Cross-Connections** from the System View. Use the Cross-Connection Wizard to provision the cross-connections.

Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit packs for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Procedure 4-6: Install DS3/EC1 circuit packs

Overview

Use this procedure to install the following DS3/EC1 circuit packs:

- LNW16 12DS3/EC1
- LNW19/19B 48DS3/EC1
  The LNW19 is DA'd and is no longer available

  Important! The high-density LNW19/19B 48DS3/EC1 circuit pack is only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The standard Alcatel-Lucent 1665 DMX Shelf does not support the high-density LNW19/19B 48DS3/EC1 circuit pack. If a high-density LNW19/19B 48DS3/EC1 circuit pack is installed in the standard Alcatel-Lucent 1665 DMX Shelf, the system will not recognize the circuit pack as an allowable type.

  To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

  It is assumed that the DS3/EC-1 cables have already been installed. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304* for cabling information.

Equipage guidelines

The system does not support mixing standard density LNW16 12DS3/EC1 and high-density LNW19/19B 48DS3/EC1 circuit packs in the same Function group. The circuit packs in a Function group *must* be the same circuit pack type. For example, both circuit packs in a Function group must be standard density LNW16 12DS3/EC1 circuit packs, or both circuit packs must be high-density LNW19/19B 48DS3/EC1 circuit packs. If the circuit packs in a Function group are different circuit pack types, the system reports an `unexpected CP type` alarm and service may be impacted.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Before you begin

Prior to beginning this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

3. Ensure that DS3/EC1 circuit packs are available for installation.
4. If installing high-density LNW19/19B 48DS3/EC1 circuit packs in the Alcatel-Lucent 1665 DMX High Capacity Shelf, verify that the new DS3/EC-1 cables are installed to the bottom connectors (J1-J8) and middle connectors (J20-J27) of the shelf backplane as required. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304* for cabling information.

Steps

Complete the following steps to install DS3/EC1 circuit packs.

1 **Important!** If the Main slots are equipped with LNW26B, 28, 77, or 121B-159B OC-48 OLIU circuit packs and LNW19/19B DS3/EC1 circuit packs are installed in Function groups A, B, or C, then STS-1 #25 through STS-1 #48 are not available for cross-connections.

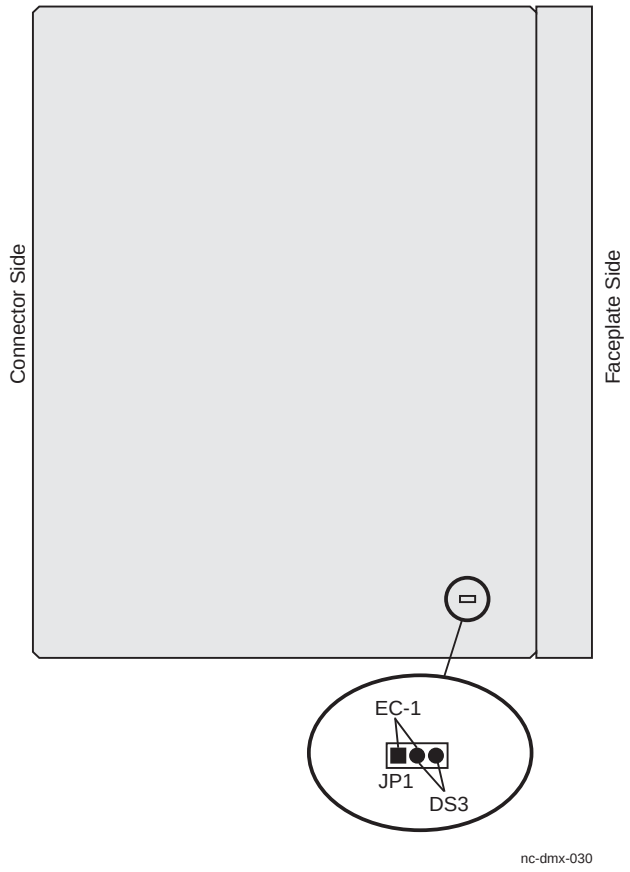
Determine the Function group slots (A, B, C, or D) being equipped with DS3/EC1 circuit packs.

Reference: “Equipage guidelines ” (p. 4-40)

2 Determine from office records or circuit order the length of the DS3/EC-1 cabling between the shelf and the DSX-3 panel or equivalent connection point and any other circuit pack parameters to be set.

3 If required, set the jumper on the LNW16 12DS3/EC1 circuit pack(s) for either DS3 or EC-1 service as illustrated in Figure 4-7, “Jumper settings for LNW16” (p. 4-42).

Figure 4-7 Jumper settings for LNW16



Important! The LNW19/19B 48DS3/EC1 circuit packs do not have the illustrated jumper; the LNW19/19B circuit pack defaults to DS3 upon installation.

Port provisioning using the *WaveStar*® CIT is supported. The electrical interface (EIF) parameter has possible values of DS3 or EC-1. If you set the jumper on the LNW16 and therefore the whole pack for DS3 or EC-1, you can still provision the ports individually for either DS3 or EC-1 service. The jumper setting only determines how the ports will come up during the initial installation of the circuit pack.

4 Open the faceplate latches and seat the DS3/EC1 circuit pack in the required Function slot by applying steady pressure to both faceplate latches.

Result: The **FAULT** LED on the DS3/EC1 circuit pack lights for approximately 30 seconds then goes off and then **ACTIVE** LED lights, indicating successful installation. (Firmware updates may take place that add additional wait time.)

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

5 Is a second (protection) DS3/EC1 circuit pack required in the companion Function slot?

If...	Then...
Yes	Continue with Step 6.
No	Verify that the companion Function slot is equipped with a circuit pack, a 177D Application Blank, or LNW98 Detectable Blank circuit pack. If the companion Function slot is unequipped, insert a 177D Application Blank or LNW98 Detectable Blank circuit pack into the slot. If an LNW98 Detectable Blank circuit pack was installed, select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View. Proceed to Step 7.

6 Open the faceplate latches and seat the second (protection) DS3/EC1 circuit pack in the companion Function slot by applying steady pressure to both faceplate latches.

Result: The **FAULT** LED on the DS3/EC1 circuit pack lights for approximately 30 seconds then goes off, indicating successful installation. (Firmware updates may take place that add additional wait time.)

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

7 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the DS3/EC1 circuit packs just installed.

8 If required at this time, provision the circuit pack and/or port parameters.

Reference: Procedure 4-7: "Provision DS3/EC1 circuit packs/ports for service" (p. 4-44)

END OF STEPS

Procedure 4-7: Provision DS3/EC1 circuit packs/ports for service

Overview

Use this procedure to provision a DS3/EC-1 circuit packs/ports for service.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure
4. Ensure DS3/EC1 circuit packs are installed.

Steps

Complete the following steps to provision a DS3/EC1 circuit packs/ports for service.

1 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the ports to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and highlight the DS3/EC1 circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

4 Provision the required circuit pack parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, go to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** to apply the changes.

5 Click **Close** to exit or continue with the next step to provision ports.

6 Find the DS3/EC-1 circuit pack with the ports being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the DS3/EC-1 circuit pack.

7 Click (highlight) the DS3/EC-1 port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear.

8 Select and provision the required port parameters, according to your work instructions.

9 **Important!** DS3 ports do *not* support J0 section trace.

If required, provision J0 section trace for the EC-1 port.

Reference: Procedure 6-13: "Provision J0 section trace" (p. 6-47)

10 If required, provision the port control plane parameters.

Reference: Procedure 9-13: "Establish external network-to-network interface (E-NNI)" (p. 9-154)

11 **Important!** The parameter settings may be applied to the selected port only or all ports on the circuit pack.

Select *This Port* or *All Ports, This Pack* in the **Apply to:** field according to the work instructions.

12 Click **Apply** to make provisioning changes. If no changes were made, continue with the next step.

Result: If *All Ports, This Pack* was selected in the **Apply to:** field, a dialog box appears asking if you want to apply all parameter settings on the screen . Click **Yes** or **No** as required.

A dialog box may appear asking you to confirm executing this command. Verify that you are provisioning the correct DS3/EC-1 port, then click **Yes** to apply your changes.

13 If required, repeat this procedure to provision another DS3/EC-1 circuit pack/port.

END OF STEPS

Procedure 4-8: Install DS1/E1 circuit packs

Overview

Use this procedure to install the following circuit packs:

- LNW6 28DS1
  The LNW6 is DA'd and is no longer available
- LNW7 28DS1PM
- LNW8 56DS1/E1
- LNW801 56DS1/E1

Important! If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, LNW6 and LNW7 DS1 circuit packs are *not* supported.

Important! The high-density LNW8 and LNW801 56DS1/E1 circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The standard Alcatel-Lucent 1665 DMX Shelf does not support the high-density LNW8 and LNW801 56DS1/E1 circuit packs. If a high-density LNW8 or LNW801 56DS1/E1 circuit pack is installed in the standard Alcatel-Lucent 1665 DMX Shelf, the system will not recognize the circuit pack as an allowable type.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

It is assumed that the DS1 cables have already been installed. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304* for cabling information.

Equipage guidelines

The system does not support mixing standard density (LNW6 and LNW7) DS1 circuit packs in the same Function group. The circuit packs in a Function group *must* be the same circuit pack type. For example, both circuit packs in a Function group must be standard density LNW6 or LNW7 circuit packs. If the circuit packs in a Function group are different circuit pack types, the system reports an `unexpected CP type` alarm and service may be impacted.

Beginning in Release 9.1, the system supports mixing high-density (LNW8 and LNW801) DS1 circuit packs in the same Function group. In this case, the circuit packs in a Function group can be the same circuit pack type. For example, both circuit packs can be high-density LNW8 circuit packs, or both circuit packs must be high-density LNW801 circuit packs, or the circuit packs in a Function group can be an LNW8 and an LNW801.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Ensure that the DS1 or DS1/E1 circuit packs are available for installation.
4. If installing high-density LNW8 or LNW801 circuit packs in the Alcatel-Lucent 1665 DMX High Capacity Shelf, verify that the DS1 cables are installed to the bottom connectors (J1-J8) and middle connectors (J20-J27) of the shelf backplane as required. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304* for cabling information.
5. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install DS1/E1 circuit packs.

1 Determine the Function group slots (A, B, C, or D) being equipped with circuit packs.

Reference: "Equipage guidelines" (p. 4-47)

2 Determine from office records or circuit order the length of the DS1 cabling between the Alcatel-Lucent 1665 DMX and the DSX-1 cross-connect point and any other circuit pack parameters to be set.

3 Open the faceplate latches and seat the circuit pack in the required Function slot by applying steady pressure to both faceplate latches.

Result: The **FAULT** LED on the DS1 or DS1/E1 circuit pack lights for approximately 30 seconds then goes off and then **ACTIVE** LED lights, indicating successful installation. (Firmware updates may take place that add additional wait time.)

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

4 Is a second (protection) circuit pack required in the companion Function slot?

If...	Then...
Yes	Continue with Step 5.
No	Verify that the companion Function slot is equipped with a circuit pack, a 177D Application Blank, or LNW98 Detectable Blank circuit pack. If the companion Function slot is unequipped, insert a 177D Application Blank or LNW98 Detectable Blank circuit pack into the slot. If an LNW98 Detectable Blank circuit pack was installed, select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View. Proceed to Step 6.

5 Open the faceplate latches and seat the second (protection) circuit pack in the companion Function slot by applying steady pressure to both faceplate latches.

Result: The **FAULT** LED on the circuit pack lights for approximately 30 seconds then goes off, indicating successful installation. (Firmware updates may take place that add additional wait time.)

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

6 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit packs just installed.

7 If required at this time, provision the circuit pack and/or port parameters.

Reference: Procedure 4-9: “Provision DS1/E1 circuit packs/ports for service” (p. 4-50)

END OF STEPS

Procedure 4-9: Provision DS1/E1 circuit packs/ports for service

Overview

Use this procedure to provision DS1/E1 circuit packs/ports for service.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the circuit pack/port addresses and the parameters/values to be provisioned.
4. Ensure the circuit pack(s) is installed.

Steps

Complete the following steps to provision a DS1/E1 circuit packs/ports for service.

1 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the ports on the circuit packs to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and highlight the DS1/E1 circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

4 **Important!** All ports on the LNW8 and LNW801 56DS1/E1 circuit packs are provisioned for either DS1 or E1; DS1 and E1 ports cannot be mixed on a single circuit pack.

Provision the required circuit pack parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, go to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** to apply the changes.

5 Click **Close** to exit or continue with the next step to provision ports.

6 Find the circuit pack with the ports being provisioned, then expand the equipment list by clicking on the plus (+) signs.

7 Click (highlight) the DS1/E1 port being provisioned, then click Select at the bottom of the window.

Result: The port parameters appear.

8 Select and provision the required port parameters, according to the work instructions.

Important! If connecting to any DLC terminal, then select **Yes** for the **Bi-Polar Violations** (BPV) parameter.

9 **Important!** The parameter settings may be applied to the selected port only or all ports on the circuit pack.

Select *This Port* or *All Ports, This Pack* in the **Apply to:** field according to the work instructions.

10 Click **Apply** to make provisioning changes. If no changes were made, continue with the next step.

Result: If *All Ports, This Pack* was selected in the **Apply to:** field, a dialog box appears asking if you want to apply all parameter settings on the screen. Click **Yes** or **No** as required.

A dialog box may appear asking you to confirm executing this command. Verify that you are provisioning the correct port(s), then click **Yes** to apply your changes.

11 If required, repeat this procedure to provision another DS1/E1 circuit pack/port.

END OF STEPS

Procedure 4-10: Install TMUX circuit packs

Overview

Use this procedure to install the following TMUX circuit packs:

- LNW18 12TMUX
- LNW20 48TMUXDS3EC1

If installing LNW20 48TMUXDS3EC1 circuit packs, the following large fabric or very large fabric OLIU circuit packs are required in the Main slots to support portless operation.

- LNW27 OC-48 OLIU
- LNW29 OC-48 OLIU
- LNW32 OC-48 OLIU
- LNW76 OC-48 OLIU
- LNW202 OC-48 OLIU
- LNW221–LNW259 OC-48 OLIU
- LNW56 OC-192 OLIU
- LNW57 OC-192 OLIU
- LNW58 OC-192 OLIU
- LNW59 OC-192 OLIU
- LNW60 OC-192 OLIU
- LNW82 OC-192 OLIU
- LNW502 OC-192 OLIU
- LNW504 OC-48/OC-192 OLIU
- LNW523 OC-192 OLIU
- LNW527 OC-192 OLIU
- LNW554 OC-192 OLIU
- LNW555 OC-192 OLIU
- LNW80 Switch

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, portless operation is supported on all ports.

If the Main slots are equipped with large fabric (non-VLF) circuit packs, portless operation is supported on the odd ports only. The even ports are unavailable.

If the Main slots are not equipped with large fabric or very large fabric OLIU circuit packs, attempts to provision portless operation will be denied.

Equipage guidelines

The circuit packs in a Function group *must* be the same circuit pack type. For example, both circuit packs in a Function group must be LNW18 TMUX circuit packs. If the circuit packs in a Function group are different circuit pack types, the system reports an `unexpected CP type` alarm and service may be impacted.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Ensure that the TMUX circuit packs are available for installation.
5. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with large fabric or very large fabric circuit packs.

Steps

Complete the following steps to install TMUX circuit packs.

1 Determine the Function group slots (A, B, C, or D) being equipped with TMUX circuit packs.

Important! If the Main slots are equipped with large fabric or very large fabric circuit packs, the LNW20 48TMUXDS3EC1 circuit packs can also be used in the Growth slots for portless-only operation.

Reference: "Equipage guidelines" (p. 4-54)

2 Open both faceplate latches and seat the circuit pack in the required slot by applying steady pressure to both faceplate latches.

Result: For circuit packs with the current firmware installed, the **FAULT** LED lights for approximately 30 seconds and then the **ACTIVE** LED lights to indicate success.

For older circuit packs, the following sequence occurs:

- The **FAULT** LED on the TMUX circuit pack lights for approximately 60 seconds,
- then the **ACTIVE** LED flashes for approximately 20 seconds.
- The **FAULT** LED goes off and the **ACTIVE** LED goes off indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

3 Is a second (protection) TMUX circuit pack required in the companion slot?

If...	Then...
Yes	Continue with Step 4.
No	Verify that the companion slot is equipped with a circuit pack, a 177D Application Blank, or LNW98 Detectable Blank circuit pack. If the companion slot is unequipped, insert a 177D Application Blank or LNW98 Detectable Blank circuit pack into the slot. If an LNW98 Detectable Blank circuit pack was installed, select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View. Proceed to Step 5.

4 Open both faceplate latches and seat the second (protection) TMUX circuit pack in the companion slot by applying steady pressure to both faceplate latches.

Result: For circuit packs with the current firmware installed, the **FAULT** LED lights for approximately 30 seconds to indicate success.

For older circuit packs, the following sequence occurs:

- The **FAULT** LED on the TMUX circuit pack lights for approximately 60 seconds,
- then the **ACTIVE** LED flashes for approximately 20 seconds.
- The **FAULT** LED goes off and the **ACTIVE** LED goes off indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

5 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit pack just installed.

6 If required at this time, provision the circuit pack and/or port parameters.

Reference: Procedure 4-11: "Provision TMUX circuit packs/ports for service" (p. 4-57)

END OF STEPS

Procedure 4-11: Provision TMUX circuit packs/ports for service

Overview

Use this procedure to provision TMUX circuit packs/ports for service.

Supported port operating modes and parameter settings for LNW20 circuit pack

Port Operating Modes	Parameter Settings		
	Electrical Interface Type	Port Mode	Trib Mode
EC1	EC1	—	—
Ported Channelized DS3	DS3	Ported	Chan
Ported Unchannelized DS3	DS3	Ported	Unchan
Portless DS3	DS3	Portless	—

EC1 operating mode

When a port is provisioned for EC1 operation, the port accepts an incoming EC-1 signal from the STSX-1 panel or equivalent connection point with individual channels available for VT1.5 or STS-1 cross-connections.

Ported Channelized DS3 operating mode

When a port is provisioned for Ported Channelized DS3 operation, the port accepts an incoming DS3 signal from the DSX panel or equivalent connection point with individual DS1 signals. The DS3 signal is terminated and demultiplexed into the individual DS1 signals. The individual DS1 signals are available for VT1.5 or STS-1 cross-connections, similar to the LNW18 TMUX circuit pack.

Ported Unchannelized DS3 operating mode

When a port is provisioned for Ported Unchannelized DS3 operation, the port accepts an incoming DS3 signal from the DSX panel or equivalent connection point that is considered unchannelized (may or may not contain DS1 signals). The DS3 signal is available for STS-1 cross-connections only.

Portless DS3

When a port is provisioned for Portless DS3 operation, a channelized DS3 signal within an STS-1 tributary from a SONET interface on a different circuit pack (OC-n or EC-1) or the same circuit pack (an EC-1 on another port) is terminated and demultiplexed into constituent DS1 signals. The DS1 signals are encapsulated into VT1.5 signals and cross-connected at the VT-level within the cross-connection fabric on the Main circuit

pack to any other interface that supports DS1 signal transport, including a DS1 interface, a channelized DS3 interface, an EC-1 or OC-n interface. This requires two bidirectional backplane STS-1 signals to convert a single (bidirectional) STS-1 channel.

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, portless DS3 operation is supported on all ports.

If the Main slots are equipped with large fabric (non-VLF) circuit packs, portless DS3 operation is supported on the odd ports only. The corresponding even port (odd port plus one) is unavailable.

If the Main slots are not equipped with large fabric or very large fabric OLIU circuit packs, attempts to provision portless DS3 operation will be denied.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Ensure that TMUX circuit pack(s) are installed.

Steps

Complete the following steps to provision TMUX circuit packs/ports for service.

1 From the System View window, click the **Alarm List** button to verify that no alarms, loopbacks, protection switch lockouts, or protection switches are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and highlight the TMUX circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

4 Provision the required circuit pack parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, go to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** to apply the changes.

5 Click **Close** to exit or continue with the next step to provision ports.

6 Find the TMUX circuit pack with the ports being provisioned, then expand the equipment list by clicking on the plus (+) signs.

7 Click (highlight) the port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear.

8 Select and provision the required port parameters, according to your work instructions.

9 **Important!** DS3 ports do *not* support J0 section trace.

If required, provision J0 section trace for the EC-1 ports.

Reference: Procedure 6-13: “Provision J0 section trace” (p. 6-47)

10 If required, provision the DS3/EC1 port control plane parameters.

Reference: Procedure 9-13: “Establish external network-to-network interface (E-NNI)” (p. 9-154)

11 **Important!** The parameter settings may be applied to the selected port only or all ports on the circuit pack.

Select *This Port* or *All Ports, This Pack* in the **Apply to:** field according to the work instructions.

12 Click **Apply** to make provisioning changes. If no changes were made, continue with the next step.

Result: If *All Ports, This Pack* was selected in the **Apply to:** field, a dialog box appears asking if you want to apply all parameter settings on the screen. Click **Yes** or **No** as required.

A dialog box may appear asking you to confirm executing this command. Verify that you are provisioning the correct port(s), then click **Yes** to apply your changes.

13 If required, repeat Step 7 through Step 12 to provision other TMUX ports.

END OF STEPS

Procedure 4-12: Install 10/100 Ethernet circuit packs

Overview

Use this procedure to install the following 10/100 Ethernet circuit packs:

- LNW66 10/100-FE
- LNW71 10/100-PL
- LNW74 10/100-T/F

Equipage guidelines (Main slots *not* equipped with Very Large Fabric circuit packs)

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the LNW66/LNW71 Ethernet circuit packs are supported in slot 1 or slot 2 of Function/Growth group A, B, C, and/or D. However, it is recommended that the LNW66/LNW71 Ethernet circuit pack be installed in Function/Growth slot A1, B1, C1, and/or D1. A 177D apparatus blank or an LNW98 Detectable Blank circuit pack must be installed in the unequipped companion Function/Growth slot. The LNW66 and LNW71 circuit packs are not supported in slot G1.

The LNW74 circuit pack is supported in slot 1 or slot 2 of Function/Growth groups A, B, C, D, and/or G. However, it is recommended that the LNW74 Ethernet circuit pack be installed in Function/Growth slot A1, B1, C1, D1, and/or G1. If the LNW74 is installed in slot G1, only the SFP 100Base-FX optical ports (17-24) are available. The 10/100 Base-T electrical ports (1-16) are *not* available on LNW74 circuit packs installed in slot G1. A 177D apparatus blank or an LNW98 Detectable Blank circuit pack must be installed in the unequipped companion Function/Growth slot.

Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group may be the same or different circuit pack type depending on the Slot Protection State.

For Ethernet circuit packs, the Slot Protection State parameter is fixed Unprotected. If the Slot Protection State is Protected and a 10/100 Ethernet circuit pack is installed, the system reports an `unexpected CP type` alarm and service may be impacted.

The following combinations of 0x1 compatible circuit pack types are supported in Function/Growth Slot 1 and Slot 2 when the Slot Protection State is Unprotected.

Slot 2	Slot 1			
	LNW66/LNW71	LNW74 (S1:2 and later)	LNW70 (S1:3 and later)/ LNW78	Other Front Access Circuit Packs (Note 1)
LNW66/LNW71	Not compatible	Not compatible	Not compatible	Compatible

Slot 2	Slot 1			
	LNW66/LNW71	**LNW74 (S1:2 and later)**	**LNW70 (S1:3 and later)/ LNW78**	**Other Front Access Circuit Packs (Note 1)**
LNW74 (S1:2 and later)	Not compatible	Compatible (Note 2)	Compatible	Compatible
LNW70 (S1:3 and later)/ LNW78	Not compatible	Compatible	Compatible	Compatible
Other Front Access Circuit Packs (Note 1)	Compatible	Compatible	Compatible	Compatible
Note 1: This includes the LNW63, LNW64, LNW67, LNW68, LNW73/73C, LNW87, LNW170, LNW705, LNW785, and all low-speed OLIU circuit packs. The LNW6, LNW7, LNW8, LNW16, LNW18, LNW19/19B, LNW20, LNW70 (S1:2 and earlier), LNW74 (S1:1), and LNW801 are not 0x1 compatible. Note 2: The circuit pack Ethernet Mode parameter must be provisioned as FX to support LNW74 circuit packs in slot 1 and slot 2; otherwise, this configuration is incompatible.				

If an incompatible circuit pack is installed in a Function/Growth slot, the system reports a `CP not allowed - eqpt` alarm.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

The Slot Protection State parameter can be changed from Protected to Unprotected or from Unprotected to Protected. If required, refer to Procedure 4-24: “Change slot protection state” (p. 4-125).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

Use only Alcatel-Lucent Approved Class 1 SFP transceivers in the LNW74 10/100-T/F circuit pack. Refer to the list of pluggable transmission modules in Procedure 4-15: “Install pluggable transmission modules” (p. 4-76).

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

Ethernet port configurations (LNW74 circuit pack only)

When the Main slots are equipped with VLF OLIU circuit packs, the LNW74 circuit pack supports the following provisionable Ethernet port configurations .

Ethernet port mode parameter setting	Description
FT_FX	Electrical FE Backplane Ports 1-16: Enabled Ports 17-24: optical FE
FX	Electrical FE Backplane Ports 1-16: Disabled Ports 17-24: optical FE

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Ensure that the appropriate Ethernet circuit pack is available for installation.
5. If required, ensure that correct pluggable transmission modules are available for installation in the LNW74 circuit pack.
6. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install a 10/100 Ethernet circuit pack.

1 Determine the Function/Growth slots being equipped with circuit pack.

Reference:

- "Equipage guidelines (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-61)
- "Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)" (p. 4-61)

2 For the LNW74 circuit pack only, ensure all optical fiber connectors and couplings are properly cleaned, if required.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

3 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean any optical pluggable transmission modules being used.

Reference: Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

4 Open both faceplate latches and seat the circuit pack in the required Function/Growth slot by applying steady pressure to both faceplate latches.

Result: If a factory-fresh circuit pack is inserted, a firmware *Smart Apply* may begin (this is indicated by a blinking **ACTIVE** LED). The Smart Apply may take from 5-8 minutes and the user should wait for it to complete.

If the Smart Apply does not occur, the **FAULT** LED on the circuit pack lights. After approximately 100 seconds, the **ACTIVE** LED lights and the **FAULT** LED goes off.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

5 **Important!** The LNW74 circuit pack ports 17-24 may be equipped with up to eight pluggable transmission modules and supports different Ethernet port configurations. Refer to " Ethernet port configurations (LNW74 circuit pack only)" (p. 4-63).

If required, install pluggable transmission modules.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

6 If the companion Function/Growth slot is unequipped, install either a 177D apparatus blank or an LNW98 Detectable Blank circuit pack in the unequipped companion Function/Growth slot.

7 From the System View menu, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

8 Verify presence of the new circuit pack in the equipment list.

9 Select (highlight) the new circuit pack, then click **Select** at bottom of window.

Result: Circuit pack parameter values display on right side of window.

10 Verify that the **Circuit Pack State** for the circuit pack reads **In Service**.

11 Click **Close** to exit.

12 From the System View window, click the **Alarm List** button to verify that no alarms are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit pack just installed.

13 If required, provision the circuit pack and/or port parameters.

Important! When a new Ethernet circuit pack is installed, Ethernet PM reporting is enabled and TCA reporting is disabled for each port and VCG. If changes are required, refer to Procedure 8-5: “Provision performance monitoring (PM) settings” (p. 8-8).

Reference: Procedure 4-14: “Provision Ethernet circuit pack/LAN port/VCG for service” (p. 4-73)

END OF STEPS

Procedure 4-13: Install Gigabit Ethernet circuit packs

Overview

Use this procedure to install the following circuit packs:

- LNW63 GBE PL
- LNW64 GBE PL
- LNW67 1GbE-SX
- LNW68 1GbE-LX
- LNW70 100/1G FXS
- LNW78 100/1G FSR
- LNW87 FE/GBE PL
- LNW170 100/1G FXS

Important! If installing LNW64 GBE PL circuit packs, the Main slots must be equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs. If the Main slots are not equipped with Very Large Fabric OLIU circuit packs, the system reports a `CP not allowed - eqpt` alarm.

Equipage guidelines (Main slots *not* equipped with Very Large Fabric circuit packs)

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the Gigabit Ethernet circuit packs are supported in slot 1 or slot 2 of Function/Growth slot A, B, C, D, and/or G. However, it is recommended that the Gigabit Ethernet circuit pack be installed in Function/Growth slot A1, B1, C1, D1, and/or G1. A 177D apparatus blank or an LNW98 Detectable Blank circuit pack must be installed in the unequipped companion Function/Growth slot.

If the Main slots are equipped with LNW26B/28 (or equivalent) OLIU circuit packs, there is a capacity limit of 24 STS-1s for circuit packs installed in slots A1, B1, and C1.

If the LNW170 100/1G FXS circuit pack in Function/Growth slot A1, B1, C1, D1 and/or G1 is configured for equipment protection, then LNW170 100/1G FXS circuit packs can also be installed in slot A2, B2, C2, D2 and/or G2.

Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group may be the same or different circuit pack type depending on the Slot Protection State.

All Gigabit Ethernet circuit packs except the LNW170 100/1G FXS circuit pack

For Gigabit Ethernet circuit packs, except the LNW170 100/1G FXS circuit pack, the Slot Protection State parameter is fixed Unprotected. If the Slot Protection State is Protected and a Gigabit Ethernet circuit pack is installed, the system reports an `unexpected CP type` alarm and service may be impacted.

LNW170 100/1G FXS circuit packs

For LNW170 100/1G FXS circuit packs, the Slot Protection State may be provisioned Unprotected or Protected.

If the Slot Protection State is Unprotected, the circuit packs within the Function/Growth group may be different circuit pack types. The default Slot Protection State is Unprotected when an LNW170 100/1G FXS circuit pack is installed in an unprovisioned Function/Growth group or in a Function/Growth group with an unprotected circuit pack.

If the Slot Protection State is Protected, the circuit packs in a Function/Growth group *must* both be the same circuit pack type.

Circuit pack type combinations

The following combinations of 0x1 compatible circuit pack types are supported in Function/Growth Slot 1 and Slot 2 when the Slot Protection State is Unprotected.

Slot 2	Slot 1			
	LNW66/LNW71	LNW74 (S1:2 and later)	LNW70 (S1:3 and later)/ LNW78	Other Front Access Circuit Packs (Note 1)
LNW66/LNW71	Not compatible	Not compatible	Not compatible	Compatible
LNW74 (S1:2 and later)	Not compatible	Compatible (Note 2)	Compatible	Compatible
LNW70 (S1:3 and later)/ LNW78	Not compatible	Compatible	Compatible	Compatible
Other Front Access Circuit Packs (Note 1)	Compatible	Compatible	Compatible	Compatible

Note 1: This includes the LNW63, LNW64, LNW67, LNW68, LNW73/73C, LNW87, LNW170, LNW705, LNW785, and all low-speed OLIU circuit packs.

The LNW6, LNW7, LNW8, LNW16, LNW18, LNW19/19B, LNW20, LNW70 (S1:2 and earlier), LNW74 (S1:1), and LNW801 are not 0x1 compatible.

Note 2: The circuit pack Ethernet Mode parameter must be provisioned as FX to support LNW74 circuit packs in slot 1 and slot 2; otherwise, this configuration is incompatible.

If an incompatible circuit pack is installed in a Function/Growth slot, the system reports a `CP not allowed - eqpt` alarm.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

The Slot Protection State parameter of a Function/Growth group equipped with LNW170 100/1G FXS circuit packs can be changed from Protected to Unprotected or from Unprotected to Protected. If required, refer to Procedure 4-24: "Change slot protection state" (p. 4-125).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

Use only Alcatel-Lucent Approved Class 1 SFP transceivers in the LNW63, LNW64, LNW70, LNW170, and LNW78 circuit packs. Refer to the list of pluggable transmission modules in Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

Ethernet port configurations (LNW63, LNW64, LNW70/LNW170, LNW74, and LNW78 circuit packs)

The LNW63, LNW64, LNW70/LNW170, LNW74, and LNW78 circuit packs support the following provisionable Ethernet port configurations. The Ethernet port configurations on LNW87 circuit packs may be provisioned independently.

Ethernet port mode parameter setting	Ethernet Circuit Packs				
	LNW63	LNW64	LNW70/ LNW170	LNW74	LNW78
GX_FX	—	—	Ports 1-4: optical GbE Ports 5-8: optical FE	—	Ports 1-2: optical GbE Ports 5-8: optical FE
GT_FX	—	—	Ports 1-4: electrical GbE Ports 5-8: optical FE	—	Ports 1-2: electrical GbE Ports 5-8: optical FE

Ethernet port mode parameter setting	Ethernet Circuit Packs				
	LNW63	LNW64	LNW70/ LNW170	LNW74	LNW78
FT_FX	—	—	Ports 1-4: electrical FE Ports 5-8: optical FE	Electrical FE Backplane Ports 1-16: Enabled Ports 17-24: optical FE	—
FX	—	—	—	Electrical FE Backplane Ports 1-16: Disabled Ports 17-24: optical FE	—
GX_FT	—	—	Ports 1-4: optical GbE Ports 5-8: electrical FE	—	Ports 1-2: optical GbE Ports 5-8: electrical FE
GT_FT	—	—	Ports 1-4: electrical GbE Ports 5-8: electrical FE	—	Ports 1-2: electrical GbE Ports 5-8: electrical FE
FT	—	—	Ports 1-8: electrical FE	—	—
GX	Ports 1-4: optical GbE	Ports 1-8: optical GbE	—	—	—
GT	Ports 1-4: electrical GbE	Ports 1-8: electrical GbE	—	—	—
GT_GX	—	Ports 1-4: electrical GbE Ports 5-8: optical GbE	—	—	—

Ethernet port configurations (LNW87 circuit packs)

The LNW87 circuit pack supports the following provisionable Ethernet port configurations. The Ethernet port configuration may be provisioned independently for each port.

Ethernet port mode parameter setting	Description
GX	Ports 1-4
GT	
FX	
FT	

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. If installing the LNW63, LNW64, LNW70, LNW87, LNW78, and/or LNW170 circuit pack, verify that the work instructions specify the required pluggable transmission modules and Ethernet port configuration to be used.
5. Ensure that the Gigabit Ethernet circuit pack is available for installation.
6. If required, ensure that the correct pluggable transmission modules are available for installation in the LNW63, LNW64, LNW70, LNW87, LNW78, and/or LNW170 circuit pack.
7. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install a Gigabit Ethernet circuit pack.

1 Determine the Function/Growth slots being equipped with the Gigabit Ethernet circuit pack.

Reference:

- "Equipage guidelines (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-66)
- "Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)" (p. 4-66)

2 Ensure all optical fiber connectors and couplings are properly cleaned.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

3 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the optical pluggable transmission modules.

Reference: Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

4 Open both faceplate latches and seat the Gigabit Ethernet circuit pack in the required Function/Growth slot.

Result: If a factory fresh circuit pack is inserted, a firmware *Smart Apply* may begin (this is indicated by a blinking **ACTIVE** LED). The Smart Apply may take from 5-8 minutes and the user should wait for it to complete.

If the Smart Apply does not occur, the **FAULT** LED on the circuit pack lights. After approximately 100 seconds, the **ACTIVE** LED lights and the **FAULT** LED goes off.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

5 **Important!** The LNW63, LNW64, LNW70, LNW87, LNW170, and LNW78 circuit packs may be equipped with pluggable transmission modules and support different Ethernet port configurations. Refer to "Ethernet port configurations (LNW63, LNW64, LNW70/LNW170, LNW74, and LNW78 circuit packs)" (p. 4-68).

If required, install pluggable transmission modules in the circuit pack according to the work instructions.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

6 If the companion Function/Growth slot is unequipped, install either a 177D apparatus blank or an LNW98 Detectable Blank circuit pack in the unequipped companion Function/Growth slot.

7 From the System View menu, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

8 Verify presence of the new circuit pack in the equipment list.

9 Select (highlight) the new circuit pack, then click **Select** at bottom of window.

Result: Circuit pack parameter values display on right side of window.

10 Verify that the **Circuit Pack State** for the circuit pack reads **In Service**. Click **Close** to exit.

11 From the System View window, click the **Alarm List** button to verify that no alarms are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit pack just installed.

12 If required, provision the circuit pack and/or port parameters.

Important! When a new Ethernet circuit pack is installed, Ethernet PM reporting is enabled and TCA reporting is disabled for each port and VCG. If changes are required, refer to Procedure 8-5: "Provision performance monitoring (PM) settings" (p. 8-8).

Reference: Procedure 4-14: "Provision Ethernet circuit pack/LAN port/VCG for service" (p. 4-73)

END OF STEPS

Procedure 4-14: Provision Ethernet circuit pack/LAN port/VCG for service

Overview

Use this procedure to provision Ethernet circuit pack/LAN ports/VCGs for service.

Important! Ethernet circuit packs/ports are provisioned for the type of service being provided. This procedure shows you how to access the parameters being provisioned, not how the parameters should be provisioned. Refer to your work instructions for parameter values or refer to Chapter 11, "Ethernet/Data network provisioning procedures" for examples of Ethernet service provisioning.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the circuit pack, LAN port, and/or VCG parameters/values to be provisioned.
4. Ensure that the circuit pack(s) is installed. If the circuit pack is not installed, refer to Procedure 4-12: "Install 10/100 Ethernet circuit packs" (p. 4-61) or Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66).
5. If required, ensure appropriate pluggable transmission module(s) is installed. Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

Steps

Complete the following steps to provision the Ethernet circuit pack/LAN ports/VCGs.

1 From the System View menu, click the **Alarm List** button to verify that no alarms are present for the ports on the circuit packs to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and click (highlight) the Ethernet circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

4 Provision the circuit pack parameters as required, then click **Apply** if changes were made. If no changes were made, continue with Step 5.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

5 Click **Close** to exit or continue with Step 6 to provision LAN ports/VCGs.

6 Find the circuit pack with the LAN ports/VCGs being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack.

7

If the circuit pack is...	Then...
equipped with pluggable transmission modules,	Perform the following: 1. Click (highlight) the required pluggable transmission module (PTM) being provisioned, then click **Select** at the bottom of the window. 2. Provision the required pluggable transmission module parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, continue with Step 8.
not equipped with pluggable transmission modules,	continue with Step 8.

8 Click (highlight) the LAN port/VCG being provisioned, then click **Select** at the bottom of the window.

Result: The LAN port/VCG parameters appear.

9 Select and provision the parameters, according to your work instructions.

Reference:

- Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)
- Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

10 If required, provision the VCG port control plane parameters.

Reference: Procedure 9-13: "Establish external network-to-network interface (E-NNI)" (p. 9-154)

11 Click **Apply** to make provisioning changes. If no changes were made, continue with Step 12.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

12 If required, repeat procedure from Step 8 through Step 11 to provision additional LAN ports/VCGs.

13 If required, repeat this procedure to provision other Ethernet circuit pack/LAN ports/VCGs.

END OF STEPS

Procedure 4-15: Install pluggable transmission modules

Overview

Use this procedure to install a pluggable transmission module in a circuit pack.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

Use only the following Alcatel-Lucent Approved Class 1 SFP/XFP transceivers.

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
EM1G//EMFE 1000BASE-T//100BASE-T	BASE-T-C1 109565549	10 Mb/s, 100 Mb/s and GbE, Copper, SFP TRCVR	LNW63 LNW64 LNW70/LNW170 LNW78 LNW87
OM155 1.3IR1	OC3IR1-I1 109453894	OC3 IR1, SM, 1310 nm, 15 km, SFP TRCVR	LNW37 LNW45 LNW55 LNW82 LNW705
OM155 1.3LR1	OC3LR1-I1 109453886	OC3 LR1, SM, 1310 nm, 40 km, SFP TRCVR	LNW37 LNW45 LNW55 LNW82 LNW705
OM155 1.3SR1	S155I2 109602599	OC-3 SR-1/STM-1, SM, 1310 nm, 2 km, SFP TRCVR	LNW37 LNW45 LNW55 LNW82 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM155//OM622 //2.5G 1.3IR1//1.3IR1// 1.3IR1	OC3X12X48-IR1-I1 109708131	OC3/STM1/OC12/ STM4/OC48/STM16, 1310nm, 15 km, SFP TRCVR	LNW55 LNW82
OM155//OM622// 2.5G 1.3LR1//1.3LR1// 1.3LR1	OC3X12X48-LR1-I1 109708149	OC3/STM1/OC12/ STM4/OC48/STM16, 1310nm, 40km, 15 km, SFP TRCVR	LNW55 LNW82
OM622 1.3IR1	OC12IR1-I1 109453902	OC12 IR1, SM, 1310 nm, 15 km, SFP TRCVR	LNW49 LNW55 LNW82 LNW203 LNW705
OM622 1.3LR1	OC12LR1-I1 109467522	OC12 LR1, SM, 1310 nm, 40 km, SFP TRCVR	LNW49 LNW55 LNW82 LNW203 LNW705
OM622 1.5LR2	OC12LR2-I1 109604447	OC12 LR2, SM, 1550 nm, 80 km, SFP TRCVR	LNW49 LNW55 LNW82 LNW203 LNW705
OM155//OM622/ CWDM-LR	S622C47EL 109664086	OC-3/STM-1 or OC-12/STM-4 CWDM, 1471 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM155//OM622/ CWDM-LR	S622C49EL 109664094	OC-3/STM-1 or OC-12/STM-4 CWDM, 1491 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705
OM155//OM622/ CWDM-LR	S622C51EL 109664102	OC-3/STM-1 or OC-12/STM-4 CWDM, 1511 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705
OM155//OM622/ CWDM-LR	S622C53EL 109664110	OC-3/STM-1 or OC-12/STM-4 CWDM, 1531 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705
OM155//OM622/ CWDM-LR	S622C55EL 109664128	OC-3/STM-1 or OC-12/STM-4 CWDM, 1551 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705
OM155//OM622/ CWDM-LR	S622C57EL 109664136	OC-3/STM-1 or OC-12/STM-4 CWDM, 1571 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM155//OM622/ CWDM-LR	S622C59EL 109664144	OC-3/STM-1 or OC-12/STM-4 CWDM, 1591 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705
OM155//OM622/ CWDM-LR	S622C61EL 109664151	OC-3/STM-1 or OC-12/STM-4 CWDM, 1611 nm, SFP TRCVR	LNW37 LNW45 LNW49 LNW55 LNW82 LNW705
OM1G 1000BASE-ZX	1000BASE-ZX-I1 109541862	GbE SM 1550 nm 1000BASE-ZX SFP TRCVR	LNW63 LNW64 LNW70/LNW170 LNW78 LNW87
OM1G//OMFC 1000BASE-LX//100/200-SM-LL-L-I[1]	GE-1X2XFC-LX-C1 109527804	GbE SM 1310 nm 1XFC/2XFC 1000BASE-LX SFP TRCVR	LNW64 LNW70/LNW170 LNW73/73C LNW78 LNW87
OM1G//OMFC 1000BASE-LX//100/200-SM-LL-L-I	GE-1X2XFC-LX-I1 109568782	GbE SM 1310 nm 1XFC/2XFC 1000BASE-LX SFP TRCVR	LNW63 LNW64 LNW70/LNW170 LNW73/73C LNW78 LNW87 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM1G//OMFC 1000BASE-SX//100/200-M5/M6-SN-S[1]	GE-1X2XFC-SX-C1 109527796	GbE MM 850 nm 1XFC/2XFC 1000BASE-SX SFP TRCVR	LNW64 LNW70/LNW170 LNW73/73C LNW78 LNW87
OM1G//OMFC 1000BASE-SX//100/200-M5/M6-SN-S	GE-1X2XFC-SX-I1 109570606	GbE MM 850 nm 1XFC/2XFC 1000BASE-SX SFP TRCVR	LNW63 LNW64 LNW70/LNW170 LNW73/73C LNW78 LNW87 LNW705
OM2.5G 1.3LR1	OC48LR1-I1 109493528	OC48 LR1, SM, 1310 nm, 40 km, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504 LNW705
OM2.5G 1.5LR2	OC48LR2-I1 109504431	OC48 LR2, SM, 1550 nm, 80 km, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504 LNW705
OM2.5G 1.3SR1	OC48SR1-I1 109564518	OC48 SR1, SM, 1310 nm, 2 km, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM2.5G 1.5LR2	S2D23C6 109610378	OC-48 /STM-16/OTU1 DWDM, 192.3 THz, 1558.983 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D25C6 109610394	OC-48 /STM-16/OTU1 DWDM, 192.5 THz, 1557.363 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D27C6 109610410	OC-48 /STM-16/OTU1 DWDM, 192.7 THz, 1555.747 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D31C6 109610451	OC-48 /STM-16/OTU1 DWDM, 193.1 THz, 1552.524 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D33C6 109610477	OC-48 /STM-16/OTU1 DWDM, 193.3 THz, 1550.918 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM2.5G 1.5LR2	S2D35C6 109610493	OC-48 /STM-16/OTU1 DWDM, 193.5 THz, 1549.315 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D37C6 109610519	OC-48 /STM-16/OTU1 DWDM, 193.7 THz, 1547.715 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D45C6 109610600	OC-48 /STM-16/OTU1 DWDM, 194.5 THz, 1541.349 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D47C6 109610626	OC-48 /STM-16/OTU1 DWDM, 194.7 THz, 1539.766 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D49C6 109610642	OC-48 /STM-16/OTU1 DWDM, 194.9 THz, 1538.186 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM2.5G 1.5LR2	S2D53C6 109610691	OC-48 /STM-16/OTU1 DWDM, 195.3 THz, 1535.036 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D55C6 109610717	OC-48 /STM-16/OTU1 DWDM, 195.5 THz, 1533.465 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G 1.5LR2	S2D59C6 109610766	OC-48 /STM-16/OTU1 DWDM, 195.9 THz, 1530.334 nm, SFP TRCVR	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G/SL-16.2	S2G7C47LI 1AB402160002	OC48/STM16 CWDM 1471 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G/SL-16.2	S2G7C49LI 1AB402160003	OC48/STM16CWDM 1491 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM2.5G/SL-16.2	S2G7C51LI 1AB402160004	OC48/STM16 CWDM 1511 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G/SL-16.2	S2G7C53LI 1AB402160005	OC48/STM16 CWDM 1531 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G/SL-16.2	S2G7C55LI 1AB402160006	OC48/STM16 CWDM 1551 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G/SL-16.2	S2G7C57LI 1AB402160007	OC48/STM16CWDM 1571 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM2.5G/SL-16.2	S2G7C59LI 1AB402160008	OC48/STM16 CWDM 1591 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM2.5G/SL-16.2	S2G7C61LI 1AB402160009	OC48/STM16 CWDM 1611 nm, SFP TRCVR S-C8L1-1D2 : S-C8L1-1D5	LNW55 LNW62 LNW82 LNW202 LNW402 LNW504
OM10G 1.5IR2 (S-64.2b)	OC192IR2-C1 109537563	OC192 IR2, SM, 1550 nm, 40 km, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G 1.5IR2 (S-64.2b)	OC192IR2-I1 109586479	OC192 IR2, SM, 1550 nm, 40 km, XFP TRCVR	LNW59 LNW705
OM10G 1.5LR2 (P1L1-2D2)	OC192LR2-C1 109537555	OC192 LR2, SM, 1550 nm, 80 km, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G 1.3SR1 (I-64.1)	OC192SR1-C1 109537902	OC192 SR1, SM, 1310 nm, 2 km, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G21C5 109615005	OC-192/STM-64/OTU2 DWDM, 192.1 THz, 1560.606 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G22C5 109615013	OC-192/STM-64/ OTU2 DWDM, 192.2 THz, 1559.794 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM10G DWDMLR (DW100U-2AxC(F))	X10G23C5 109615021	OC-192/STM-64/ OTU2 DWDM, 192.3 THz, 1558.983 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G24C5 109615039	OC-192/STM-64/ OTU2 DWDM, 192.4 THz, 1558.173 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G25C5 109615047	OC-192/STM-64/ OTU2 DWDM, 192.5 THz, 1557.363 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G26C5 109615054	OC-192/STM-64/ OTU2 DWDM, 192.6 THz, 1556.555 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G27C5 109615062	OC-192/STM-64/ OTU2 DWDM, 192.7 THz, 1555.747 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G28C5 109615070	OC-192/STM-64/ OTU2 DWDM, 192.8 THz, 1554.940 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G31C5 109615104	OC-192/STM-64/ OTU2 DWDM, 193.1 THz, 1552.524 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM10G DWDMLR (DW100U-2AxC(F))	X10G33C5 109615120	OC-192/STM-64/ OTU2 DWDM, 193.3 THz, 1550.918 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G35C5 109615146	OC-192/STM-64/ OTU2 DWDM, 193.5 THz, 1549.315 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G37C5 109615161	OC-192/STM-64/ OTU2 DWDM, 193.7 THz, 1547.715 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G45C5 109615245	OC-192/STM-64/ OTU2 DWDM, 194.5 THz, 1541.349 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G47C5 109615260	OC-192/STM-64/ OTU2 DWDM, 194.7 THz, 1539.766 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G49C5 109615286	OC-192/STM-64/ OTU2 DWDM, 194.9 THz, 1538.186 nm, XFP TRCVR	LNW59 LNW502 LNW504 LNW603 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OM10G DWDMLR (DW100U-2AxC(F))	X10G52C5 109615310	OC-192/STM-64/ OTU2 DWDM, 195.2 THz, 1535.822 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G53C5 109615328	OC-192/STM-64/ OTU2 DWDM, 195.3 THz, 1535.036 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G54C5 109615336	OC-192/STM-64/ OTU2 DWDM, 195.4 THz, 1534.250 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G55C5 109615344	OC-192/STM-64/ OTU2 DWDM, 195.5 THz, 1533.465 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G56C5 109615351	OC-192/STM-64/ OTU2 DWDM, 195.6 THz, 1532.681 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G57C5 109615369	OC-192/STM-64/ OTU2 DWDM, 195.7 THz, 1531.898 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G58C5 109615377	OC-192/STM-64/ OTU2 DWDM, 195.8 THz, 1531.116 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705
OM10G DWDMLR (DW100U-2AxC(F))	X10G59C5 109615385	OC-192/STM-64/ OTU2 DWDM, 195.9 THz, 1530.334 nm, XFP TRCVR	LNW59 LNW502 LNW603 LNW705

Name/ Qualifier	Pluggable Transmission Module Code/Comcode	Description	Compatible Circuit Packs
OMESCON MMF	ESCON-MM-I1 109523886	ESCON MM, 1310 nm SFP TRCVR	LNW73/73C
OMFE 100BASE-LX-SM	100BASE-LX-I1 109527812	100 Mb/s optical Fast Ethernet SFP TRCVR	LNW70/LNW170 LNW74 LNW78 LNW87
OMFE 100BASE-FX	100BASE-FX-I1 109703140	100 Mb/s optical Fast Ethernet SFP TRCVR	LNW70/LNW170 LNW74 LNW78 LNW87
OMFE 100BASE-ZX	100BASE-ZX-I1 109703157	100 Mb/s optical Fast Ethernet SFP TRCVR	LNW74 LNW87 LNW70/170

Notes:

1. This PTM is DA'd and is not longer available.

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

Ethernet port configurations (LNW63, LNW64, LNW70/LNW170, LNW74, and LNW78 circuit packs)

The LNW63, LNW64, LNW70/LNW170, LNW74, and LNW78 circuit packs support the following provisionable Ethernet port configurations. The Ethernet port configurations on LNW87 circuit packs may be provisioned independently.

Ethernet port mode parameter setting	Ethernet Circuit Packs				
	LNW63	LNW64	LNW70/ LNW170	LNW74	LNW78
GX_FX	—	—	Ports 1-4: optical GbE Ports 5-8: optical FE	—	Ports 1-2: optical GbE Ports 5-8: optical FE

Ethernet port mode parameter setting	Ethernet Circuit Packs				
	LNW63	LNW64	LNW70/ LNW170	LNW74	LNW78
GT_FX	—	—	Ports 1-4: electrical GbE Ports 5-8: optical FE	—	Ports 1-2: electrical GbE Ports 5-8: optical FE
FT_FX	—	—	Ports 1-4: electrical FE Ports 5-8: optical FE	Electrical FE Backplane Ports 1-16: Enabled Ports 17-24: optical FE	—
FX	—	—	—	Electrical FE Backplane Ports 1-16: Disabled Ports 17-24: optical FE	—
GX_FT	—	—	Ports 1-4: optical GbE Ports 5-8: electrical FE	—	Ports 1-2: optical GbE Ports 5-8: electrical FE
GT_FT	—	—	Ports 1-4: electrical GbE Ports 5-8: electrical FE	—	Ports 1-2: electrical GbE Ports 5-8: electrical FE
FT	—	—	Ports 1-8: electrical FE	—	—
GX	Ports 1-4: optical GbE	Ports 1-8: optical GbE	—	—	—
GT	Ports 1-4: electrical GbE	Ports 1-8: electrical GbE	—	—	—
GT_GX	—	Ports 1-4: electrical GbE Ports 5-8: optical GbE	—	—	—

Ethernet port configurations (LNW87 circuit packs)

The LNW87 circuit pack supports the following provisionable Ethernet port configurations. The Ethernet port configuration may be provisioned independently for each port.

Ethernet port mode parameter setting	Description
GX	Ports 1-4
GT	
FX	
FT	

LNW55 OC3/OC12/OC48 OLIU circuit pack port configurations

The LNW55 OC3/OC12/OC48 OLIU circuit pack is a 12-port, SFP-based, multirate (OC-3, OC-12, OC-48), low-speed optical circuit pack. The LNW55 OLIU circuit pack supports a maximum of either 12 OC-3 ports, or 12 OC-12 ports, or 4 OC-48 ports.

Mixing port optical rates is supported with the following restrictions.

- OC-48 interfaces are only supported on ports 1, 4, 7, and 10.
- When the Signal Type parameter is provisioned to OC-48 for port 1, 4, 7, or 10, then the next two adjacent ports are unavailable for use. For example, if the Signal Type parameter for port 1 is provisioned to OC-48, then ports 2 and 3 are unavailable for use (STNA - Signal Type Not Available).

Before installing a pluggable transmission module in an LNW55 OLIU circuit pack, the port Signal Type parameter must be provisioned to match the pluggable transmission module. If the port Signal Type parameter is STNA (default value) and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

LNW82 OC3/OC12/OC48 OLIU circuit pack port configurations

The LNW82 OC3/OC12/OC48 OLIU circuit pack is an 8-port, SFP-based, multirate (OC-3, OC-12, OC-48), high-speed optical circuit pack. The LNW82 OLIU circuit pack supports a maximum of either 8 OC-3 ports, or 8 OC-12 ports, or 2 OC-48 ports.

Mixing port optical rates is supported with the following restrictions.

- OC-48 interfaces are only supported on ports 1 and 5.
- When the Signal Type parameter is provisioned to OC-48 for port 1 or 5, then the next three adjacent ports are unavailable for use. For example, if the Signal Type parameter for port 1 is provisioned to OC-48, then ports 2, 3, and 4 are unavailable for use (STNA - Signal Type Not Available).

Before installing a pluggable transmission module in an LNW82 OLIU circuit pack, the port Signal Type parameter must be provisioned to match the pluggable transmission module. If the port Signal Type parameter is STNA (default value) and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

LNW504 OC-48/OC-192 OLIU circuit pack port configurations

The LNW504 is an 8-port, SFP/XFP-based, multirate (OC-48, OC-192) high-speed optical circuit pack. The LNW504 OLIU circuit pack supports a maximum of 4 OC-48 interfaces and 4 OC-192 interfaces with the following restrictions:

- OC-192 interfaces are supported on lines 1-4.
- OC-48 interfaces are supported on lines 5-8
- If port 4 is provisioned to OC-192 then ports 5-8 cannot be used (STNA). If port 4 is provisioned to STNA, then ports 5-8 are provisioned for OC–48.

Before installing a pluggable transmission module in an LNW504 OLIU circuit pack, the port Signal Type parameter must be provisioned to match the pluggable transmission module. If the port Signal Type parameter is STNA (default value) and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

LNW705 10G Muxponder circuit pack client port configurations

The LNW705 10G Muxponder circuit pack supports a mix of 1GE, FC100, FICON, FC200, FICON_EXP, and/or OC3/12/48 client signals. The client signals are mapped into a single STS-192 and transmitted as an OTN OTU-2 signal.

Mixing client signals is supported with the following restrictions.

- OC-48, FC200, FICON_EXP signals are only supported on client ports 1, 3, 5, and 7.
- When the Signal Type parameter is provisioned to OC-48, FC200, FICON_EXP for client port 1, 3, 5, or 7, then the next adjacent client port is unavailable for use. For example, if the Signal Type parameter for client port 1 is provisioned to OC-48, then client port 2 is unavailable for use (STNA - Signal Type Not Available).

Before installing a pluggable transmission module in an LNW705 10G Muxponder circuit pack, the port Signal Type parameter must be provisioned to match the pluggable transmission module. If the port Signal Type parameter is STNA (default value) and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the required pluggable transmission module, circuit pack, and socket.
5. Ensure that the correct pluggable transmission module is available for installation.

Steps

Complete the following steps to install a pluggable transmission module in a circuit pack that has already been installed in the shelf.

1 Determine the circuit pack and socket being equipped with the pluggable transmission module.

2 **Important!** Before installing a pluggable transmission module in an LNW55, LNW82, LNW504, or LNW705 (client ports only) circuit pack, the port Signal Type parameter must be provisioned to match the pluggable transmission module.

If the LNW705 circuit pack OTU2 port is connected to a LNW785 circuit pack input, the expected frequency must be provisioned to match the LNW785 circuit pack channel frequency.

If the port Signal Type parameter is STNA (default value) and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

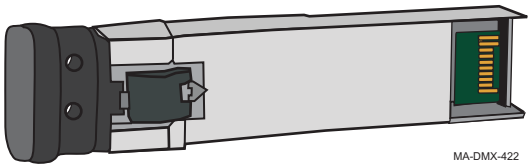
If required, select **Configuration** → **Equipment** to access the required port and provision the port Signal Type parameter to match the pluggable transmission module.

Reference:

- Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)
- Procedure 4-30: "Provision 10G Muxponder circuit pack SONET/GbE/Data client port" (p. 4-144)

3 Hold the connector/latch-end of the module in your left hand with the gold fingers facing you. The module should be positioned in manner similar to Figure 4-8, "Pluggable transmission module with dust cover (Optical PTMs only)" (p. 4-94).

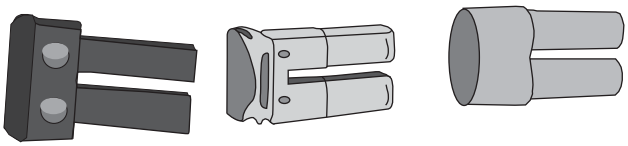
Figure 4-8 Pluggable transmission module with dust cover (Optical PTMs only)



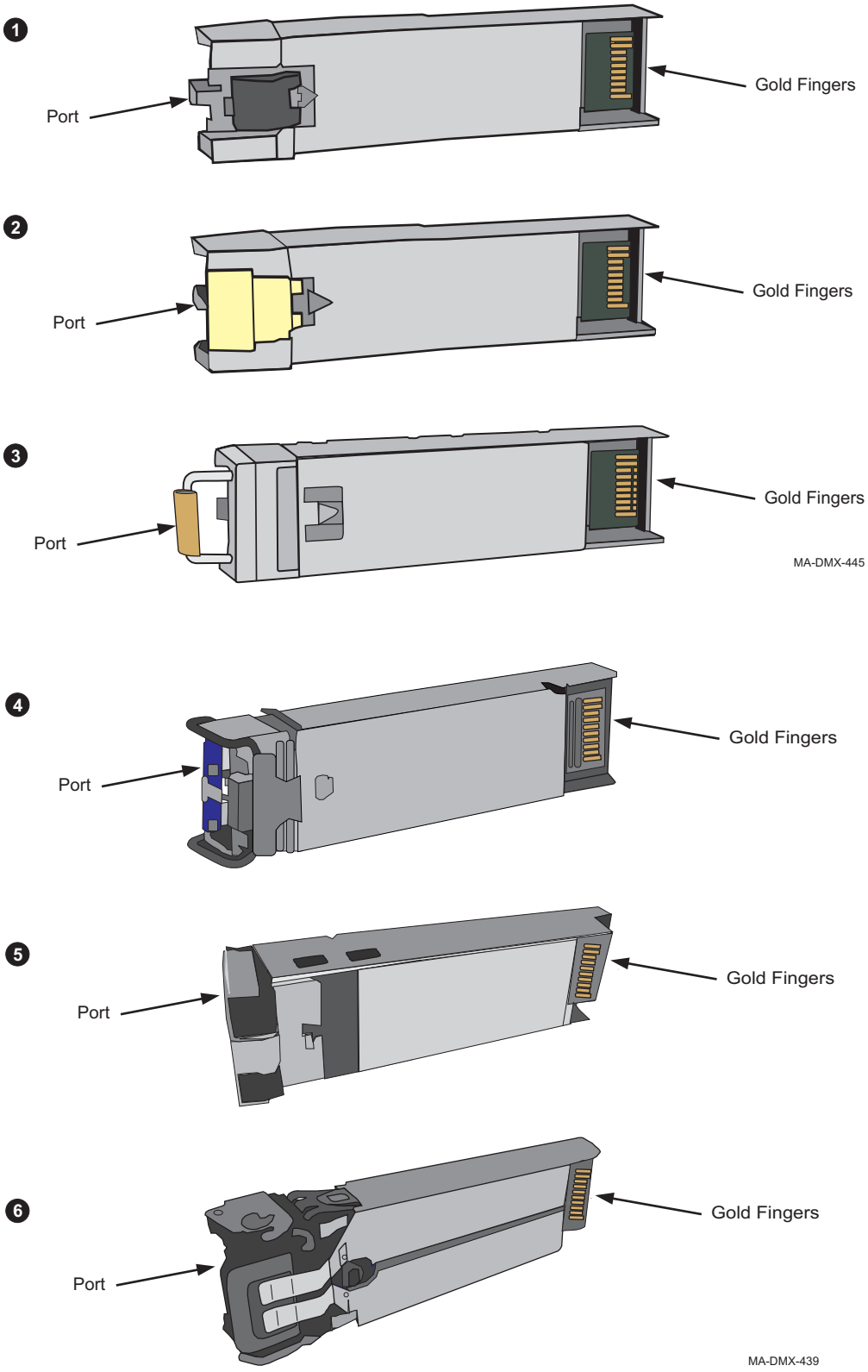
Important! Do not remove the dust cover unless you are ready to connect cabling or if you need to clean the module.

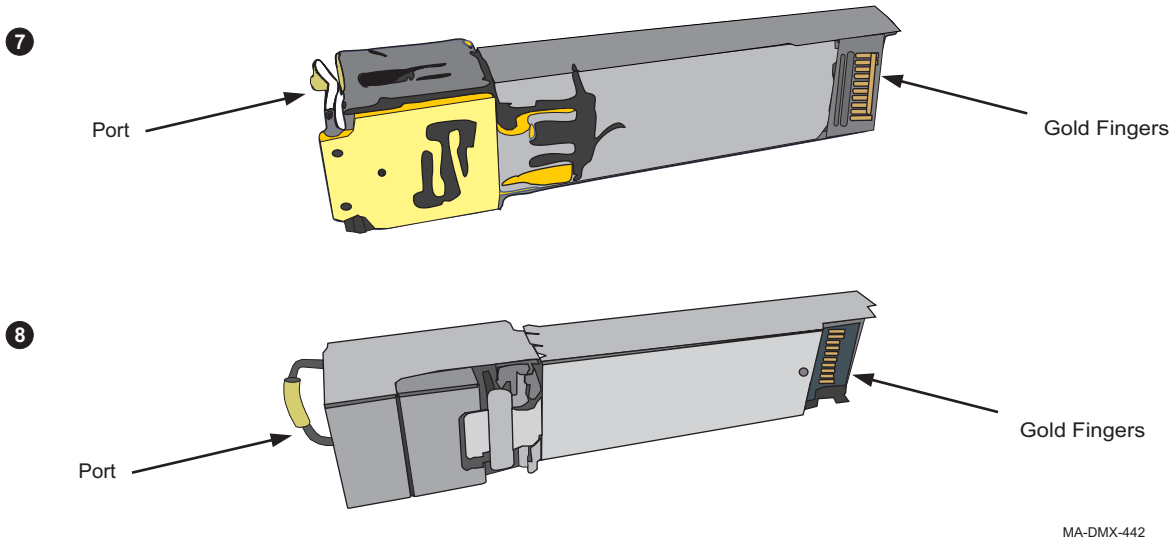
Dust covers (Optical PTMs only) There are a variety of different types of dust covers. Any of the following examples could be similar to the dust cover in your pluggable transmission module.

Figure 4-9 Examples of dust covers



4 Referring to the figure below, determine the type of latching mechanism on the pluggable transmission module you have.


1
Port
Gold Fingers
2
Port
Gold Fingers
3
Port
Gold Fingers
MA-DMX-445
4
Port
Gold Fingers
5
Port
Gold Fingers
6
Port
Gold Fingers
MA-DMX-439



5 **Important!** Optical pluggable transmission modules are shipped with a dust cover installed into the ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the cabling is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the optical pluggable transmission module.

Reference: Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

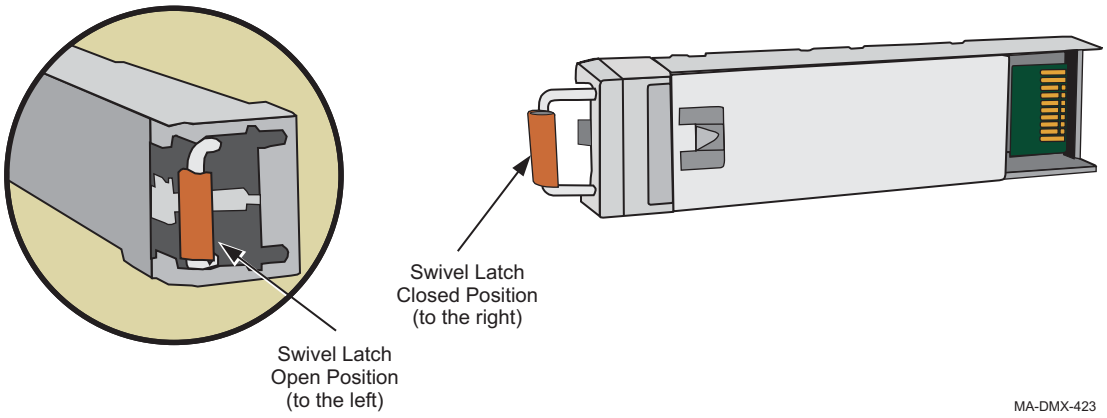
6 Referring to Step 4, what type of latching mechanism does your module have?

If...	Then...
Type 1 or 2 (optical)	Proceed to Step 10.
Type 3 (optical)	Continue with Step 7.
Type 4, 5, or 6 (optical)	Proceed to Step 9.
Type 7 or 8 (electrical)	Proceed to Step 9.

7 Before inserting the module, the latch must be in the closed position. With the dust cover in place, the latch is in the closed position.

Figure 4-10 shows the open and closed position of the latch. Depending on your PTM type, the appearance of the port opening and latch mechanism may vary.

Figure 4-10 Latch type 3 (opened and closed)

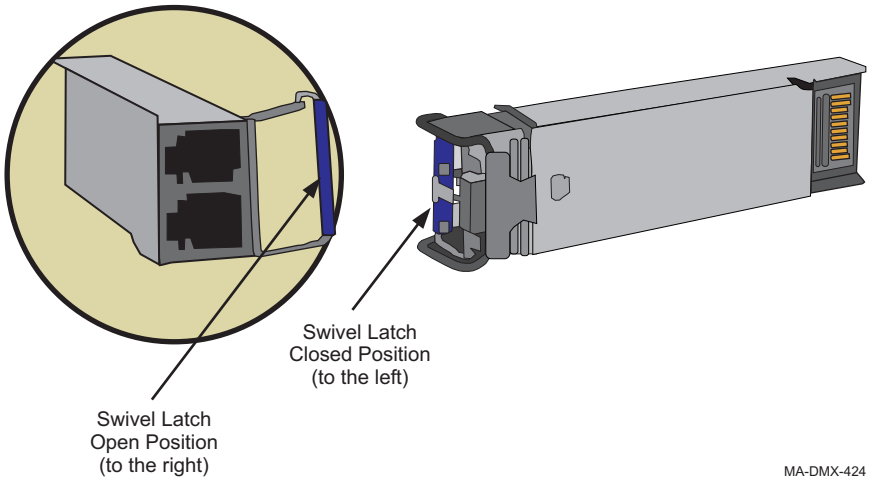


8 Proceed to Step 10.

9 Before inserting the module, the latch must be in the closed position. With the dust cover in place, the latch is in the closed position.

Figure 4-11 shows the open and closed position of the latch. Depending on your PTM type, the appearance of the port opening and latch mechanism may vary.

Figure 4-11 Latch type 4, 5, 6, 7 and 8 (opened and closed)

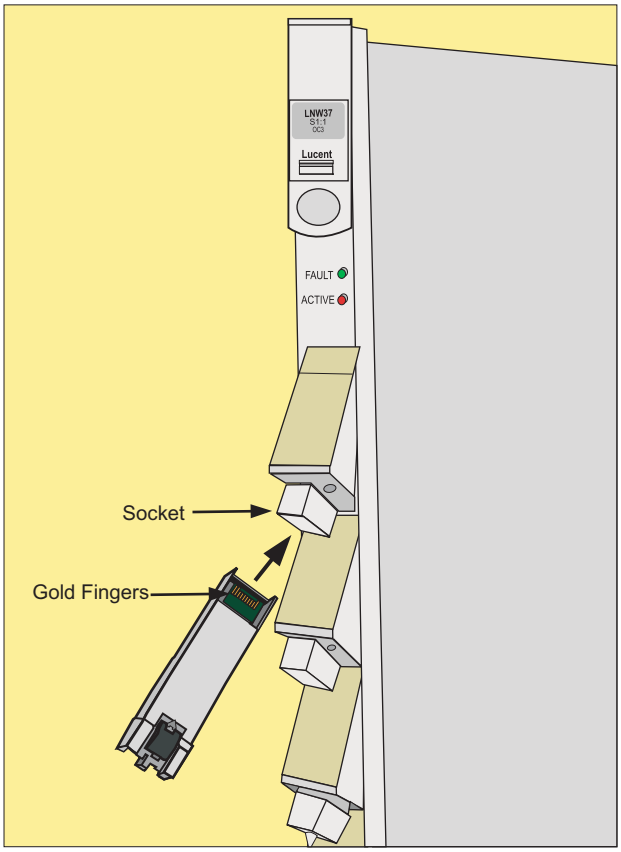


10 With your left hand, hold the pluggable transmission module by the dust cover (optical) or port end (electrical). The ports are in your left hand and the gold fingers are visible (facing you). (Do not insert pluggable transmission module).

11 Rotate the module; the dust cover or port end is facing you and the gold fingers are pointing away from you and are facing to the right. (Do not insert pluggable transmission module).

12 Insert the pluggable transmission module in the required socket of the circuit pack faceplate. Confirm that the pluggable transmission module is locked in the socket. Verify that all unused sockets on the circuit pack are equipped with dust covers.

Figure 4-12 Insert pluggable transmission module into socket



Result: Select **View** → **Refresh System View** and the port appears in the *WaveStar*® CIT System View indicating successful installation.

If response is not correct, replace the pluggable transmission module. If the pluggable transmission module fails when inserted, and another pluggable transmission module in the shelf fails at the same time, replace the newly-installed pluggable transmission module. Each pluggable transmission module has unique internal data for warranty purposes. If this data for any reason is not unique, both pluggable transmission

modules with the duplicated information will be declared failed. For information on replacing a pluggable transmission module, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

13 Push on the dust cover or port end to insert the module. The latch automatically catches when the module is inserted. The module is secure.

To verify that the pluggable transmission module is properly latched in the cage, gently pull the pluggable transmission module (parallel to the direction the pluggable transmission module was installed). Do *not* rotate the swivel latch or activate the de-latching feature on the pluggable transmission module.

14

If pluggable transmission module was installed in an...	Then...
Optical OLIU circuit pack and SONET optical port testing is required,	Continue with Step 15
Optical OLIU circuit pack and SONET optical port testing is *not* required,	Proceed to Step 16.
Ethernet/Data circuit pack,	Proceed to Step 16.

15 Test the SONET optical port for proper operation, if required.

1. Select **Configuration** → **DCC Terminations** to access the installed OC-n optical port and provision *OSI over DCC* as **disabled** to prevent DCC-related alarms. Click **Apply** and **Close**.
2. Loop back the port to test port functionality. Refer to Procedure 14-6: "Connect OLIU optical loopbacks" (p. 14-58).
3. Remove the lightguide jumper used to loop back the port and the LBO, if required. Verify that the circuit pack **FAULT** LED and port LED start flashing. The **MN** and **NE** LEDs are lighted on the SYSCTL circuit pack.
4. Click the **Alarm List** button to obtain the *NE Alarm List* and verify that the alarm is associated with the port being tested.
5. If required, reinstall the dust cover into the port on the pluggable transmission module to maintain cleanliness.
6. Select **Configuration** → **Update System** → **Update All**. Verify that the circuit pack **FAULT** LED and port LED associated with the pluggable transmission module stop flashing and all alarms clear.

Reference: Procedure 14-6: “Connect OLIU optical loopbacks” (p. 14-58)

16 If required, repeat this procedure to install additional pluggable transmission modules.

17 From the System View window, click the **Alarm List** button to obtain the *NE Alarm List*. Verify that no alarms, protection switches, protection switch lockouts, and loopbacks are present for the ports just installed.

Result: No alarms should be present for the ports just installed.

18 If required at this time, provision circuit pack and/or port parameters for service.

Reference:

- Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)
- Procedure 4-14: “Provision Ethernet circuit pack/LAN port/VCG for service” (p. 4-73)
- Procedure 4-18: “Provision Fibre Channel circuit pack/Data port/VCG for service” (p. 4-106)

END OF STEPS

Procedure 4-16: Install LNW80 switch pack

Overview

Use this procedure to install LNW80 Switch circuit packs in Main slots **M1** and **M2**.

The LNW80 Switch circuit pack has *no* optics and is used in headless main applications to allow full use of the VT1.5 switch fabric for VT1.5-type hairpin cross-connections. The LNW80 circuit pack supports equipment-related alarms.

The LNW80 Switch circuit pack requires no provisioning and does not support loopbacks, test access, performance monitoring, DCC functionality, incoming signal alarms, line timing, DS1 synchronization outputs, and upgrades. The LNW80 Switch circuit pack cannot be a cross-connection source or destination.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Perform the following to install LNW80 Switch circuit packs in Main slots **M1** and **M2**.

1 Seat the first Switch Pack in Main slot **M1**.

Result: The **FAULT** LED and **ACTIVE** LED lights. The **FAULT** LED flashes after about 20 seconds and then goes off. **MJ** or **MN** and **NE** alarm LEDs on the SYSCTL circuit pack light when the circuit pack is installed.

2 Seat the second Switch Pack circuit pack in Main slot **M2**.

Result: The **FAULT** LED and **ACTIVE** LED lights. The **FAULT** LED flashes after about 20 seconds and then goes off. **MJ** or **MN** and **NE** alarm LEDs on the SYSCTL circuit pack light when the circuit pack is installed.

END OF STEPS

Procedure 4-17: Install Fibre Channel circuit packs

Overview

Use this procedure to install an LNW73/LNW73C Fibre Channel circuit pack.

Equipage guidelines (Main slots *not* equipped with Very Large Fabric circuit packs)

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, Fibre Channel circuit packs must be installed in Function/Growth slot A1, B1, C1, D1 and/or G1. However, if you are using an LNW26B/28 (or equivalent) OLIU in the Main slots, there is a capacity limit of 24 STS-1s for circuit packs installed in slots A1, B1, and C1.

The Fibre Channel circuit pack is not supported in Function/Growth slots A2, B2, C2, D2, and G2.

Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group may be the same or different circuit pack type depending on the Slot Protection State.

For Fibre Channel circuit packs, the Slot Protection State parameter is fixed Unprotected. If the Slot Protection State is Protected and a Fibre Channel circuit pack is installed, the system reports an `unexpected CP type` alarm and service may be impacted. If the Slot Protection State is Unprotected, a Fibre Channel circuit pack may be installed in a Function/Growth group with any Ethernet/Data or low-speed OLIU circuit pack.

If an incompatible circuit pack is installed in a Function/Growth slot, the system reports a `CP not allowed - eqpt` alarm.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

The Slot Protection State parameter can be changed from Protected to Unprotected or from Unprotected to Protected. If required, refer to Procedure 4-24: “Change slot protection state” (p. 4-125).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

Use only Alcatel-Lucent Approved Class 1 SFP transceivers in the LNW73/LNW73C circuit pack. Refer to the list of pluggable transmission modules in Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Ensure that a Fibre Channel circuit pack is available for installation.
4. Obtain your work instructions for this procedure.
5. Ensure that the correct pluggable transmission modules are available for installation in the LNW73/LNW73C Fibre Channel circuit pack.
6. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install a Fibre Channel circuit pack.

1 Determine the Function/Growth slots being equipped with a Fibre Channel circuit pack.

Reference:

- "Equipage guidelines (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-102)
- "Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)" (p. 4-102)

2 Ensure all optical fiber connectors and couplings are properly cleaned.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

3 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the optical pluggable transmission modules.

Reference: Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

4 Open both faceplate latches and seat the Fibre Channel circuit pack in the required Function/Growth slot.

Result: Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

5 Install the required pluggable transmission modules.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

6 If the companion Function/Growth slot is unequipped, install either a 177D apparatus blank or an LNW98 Detectable Blank circuit pack in the unequipped companion Function/Growth slot.

7 From the System View menu, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

8 Verify presence of the new circuit pack in the equipment list.

9 Select (highlight) the new circuit pack, then click **Select** at bottom of window.

Result: Circuit pack parameter values display on right side of window.

10 Verify that the **Circuit Pack State** for the circuit pack reads **In Service**. Click **Close** to exit.

11 From the System View window, click the **Alarm List** button to verify that no alarms are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit pack just installed.

12 If required, provision the circuit pack, Data port, and/or VCG parameters.

Important! When the circuit pack is installed, PM reporting is enabled and TCA reporting is disabled for each Data port and VCG. If changes are required, refer to Procedure 8-5: "Provision performance monitoring (PM) settings" (p. 8-8).

Reference: Procedure 4-18: "Provision Fibre Channel circuit pack/Data port/VCG for service" (p. 4-106)

END OF STEPS

Procedure 4-18: Provision Fibre Channel circuit pack/Data port/VCG for service

Overview

Use this procedure to provision Fibre Channel circuit pack/Data ports/VCGs for service.

Important! Fibre Channel circuit packs/Data ports/VCGs are provisioned for the type of service being provided. This procedure shows you how to access the parameters being provisioned, not how the parameters should be provisioned. Refer to your work instructions for parameter values or refer to Chapter 11, "Ethernet/Data network provisioning procedures" for examples of service provisioning.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain work instructions for this procedure.
3. Ensure that the circuit pack(s) is installed. If the circuit pack is not installed, refer to Procedure 4-17: "Install Fibre Channel circuit packs" (p. 4-102) .
4. Ensure that the appropriate pluggable transmission module(s) is installed. Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

Steps

Complete the following steps to provision the Fibre Channel circuit pack/Data ports/VCGs.

1 From the System View menu, click the **Alarm List** button to verify that no alarms are present for the circuit packs to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and click (highlight) the Fibre Channel circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

4 **Important!** When the **Data Type** parameter is provisioned to *FC-FICON*, the Data ports on the circuit pack can be configured individually for Fibre Channel or FICON. When the **Data Type** parameter is provisioned to *ESCON*, all Data ports on the circuit pack are configured for ESCON.

Provision the circuit pack parameters as required, then click **Apply** if changes were made. If no changes were made, continue with Step 5.

Reference: Procedure 11-36: "Provision LNW73/LNW73C FC-DPORT circuit pack parameters" (p. 11-282)

5 Click **Close** to exit or continue with Step 6 to provision Data ports/VCGs.

6 Find the circuit pack with the Data ports/VCGs being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack.

7

If the circuit pack is...	Then...
equipped with pluggable transmission modules,	Perform the following: 1. Click (highlight) the required pluggable transmission module (PTM) being provisioned, then click **Select** at the bottom of the window. 2. Provision the required pluggable transmission module parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, continue with Step 8.
not equipped with pluggable transmission modules,	continue with Step 8.

8 Click (highlight) the Data port/VCG being provisioned, then click **Select** at the bottom of the window.

Result: The Data port/VCG parameters appear.

9 Select and provision the parameters, according to your work instructions.

Reference: Procedure 11-37: "Provision FC-DPORT DATA port parameters" (p. 11-284)

Procedure 11-38: "Provision FC-DPORT VCG parameters" (p. 11-288)

10 Click **Apply** to make provisioning changes. If no changes were made, continue with Step 11.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

11 If required, repeat Step 8 through Step 10 to provision additional Data ports/VCGs.

END OF STEPS

Procedure 4-19: Provision pluggable transmission module

Overview

Use this procedure to provision pluggable transmission modules.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify the work instruction specify the parameters and values to be provisioned.

Steps

Complete the following steps to provision pluggable transmission modules.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Find the circuit pack with the pluggable transmission modules being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the required circuit pack. Select the required *PTM* and click **Select**.

Result: The pluggable transmission module parameters appear.

3 Provision the required pluggable transmission module parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, click **Close** to exit.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply the changes. Click **Close** to exit.

If the Maintenance State parameter is provisioned to *Maint*, `Pluggable transmission module maintenance IP` and `ABN condition` are reported. While in the Maintenance state, any subsequent removal of the pluggable transmission module is reported with an alarm severity level no higher than

a standing condition regardless of the assigned ASAP alarm severity level. Changing the Maintenance state does not affect the alarm severity level of any existing removal alarms.

4 If required, repeat this procedure to provision other pluggable transmission modules.

END OF STEPS

Procedure 4-20: Provision non-volatile memory cards

Overview

Use this procedure to provision non-volatile memory cards in the SYSCTL.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify the work instruction specify the parameters and values to be provisioned.

Steps

Complete the following steps to provision non-volatile memory cards in the SYSCTL circuit pack.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Expand the SYSCTL list by clicking on the plus (+) sign next to the required circuit pack. Select the required *NVM* and click **Select**.

Result: The Non-Volatile Memory Information appears.

3 Provision Alarm Severity Assignment Profile according to the work instructions, then click **Apply** if changes were made. If no changes were made, click **Close** to exit.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply the changes. Click **Close** to exit.

4 If required, repeat this procedure to provision the other NVM.

END OF STEPS

Procedure 4-21: Provision STS-n/VT1.5 tributary

Overview

Use this procedure to an STS-n/VT1.5 tributary.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify the work instruction specify the parameters and values to be provisioned.

Steps

Complete the following steps to provision an STS-n/VT1.5 tributary.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Find the circuit pack with the STS-n/VT1.5 tributary being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the required circuit pack and port. Select the required tributary and click **Select**.

Result: The tributary parameters appear.

3 Provision the required tributary parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, click **Close** to exit.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply the changes. Click **Close** to exit.

4 If required, repeat this procedure to provision other tributaries.

END OF STEPS

Procedure 4-22: Change circuit pack mode of LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs

Overview

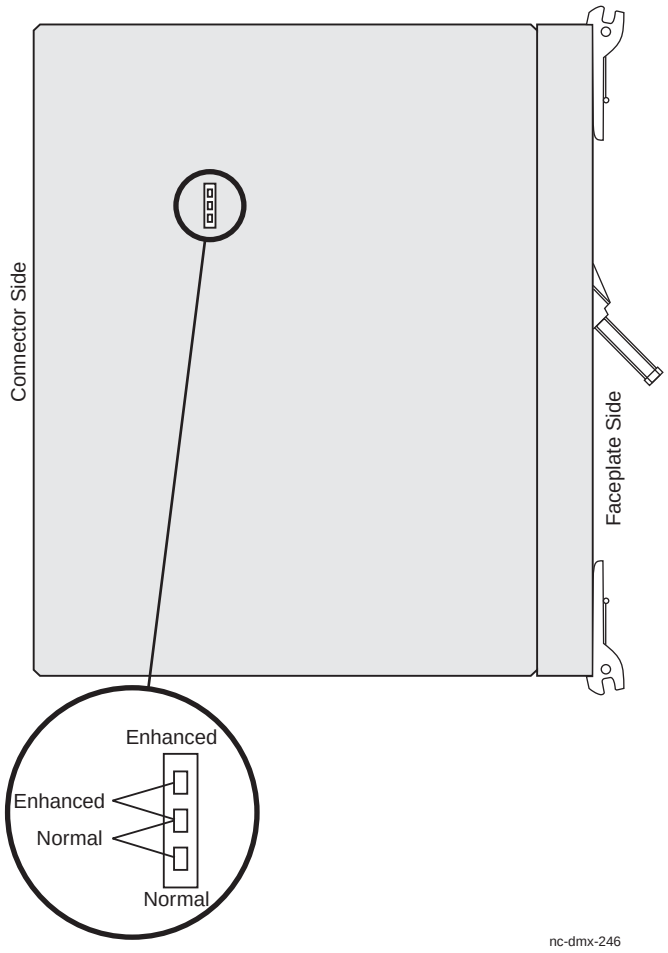
Use this procedure to change the Circuit Pack Mode of the LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs installed in the Main slots.

Important! This procedure supports changing the Circuit Pack Mode parameter from *Normal* to *Enhanced* only. Changing the Circuit Pack Mode parameter from *Enhanced* to *Normal* is not supported.

Normal/Enhanced jumper

The LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs are equipped with a Normal/Enhanced jumper used to provision the Circuit Pack Mode parameter. (The Circuit Pack Mode parameter is not CIT provisionable.) If the Normal/Enhanced jumper is in the *Normal* position, the circuit pack can cross-connect VT1.5 signals in up to any 6 STS-1 signals. If the Normal/Enhanced jumper is in the *Enhanced* position, the circuit pack can cross-connect VT1.5 signals in up to any 12 STS-1 signals.

Refer to the following figure for the location of the Normal/Enhanced jumper and the jumper settings.



Privilege level

You must log in as a Privileged or General user to complete this procedure.

NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the high-speed network configuration (for example, UPSR or BLSR).

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to change the Circuit Pack Mode of the LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs installed in the Main slots.

1 Click the **Alarm List** button in the top right corner of the System View or select **Fault** → **NE Alarm List** to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

4 **Important!** Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the OC-48 OLIU circuit pack in Main slot **M1**.

If the local operating procedures specify...	Then...
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 11.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 5.

5 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the OC-48 OLIU circuit pack in Main slot **M1**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

6 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, an optional manual timing switch can be performed before removing the circuit pack in Main slot **M1**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-48 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

7 If required, repeat Step 5 to verify that the OC-48 OLIU circuit pack in Main slot **M2** is now the active circuit pack for timing.

8 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the OC-48 OLIU circuit pack in Main slot **M1**.

If ...	Then...
UPSR,	Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m1-()-()* paths supported by the circuit pack in Main slot **M1** (*Ring 1*). Record the active paths supported by the circuit pack in Main slot **M1** (*Ring 1*). Click **Close**.
BLSR or 1+1,	Select **Reports** → **Status Lists** → **Pack**. Click *Shelf* and **Select**. Observe the value of the *Switch State* parameter for the *main-1* circuit pack. If the *Switch State* parameter is *ACTIVE*, some Function units are receiving traffic from the *main-1* circuit pack. Click **Close**.

9 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is an active circuit pack for transmission, optional manual switches can be performed before removing the circuit pack in Main slot **M1**. In UPSRs, each path supported by the circuit pack in Main slot **M1** must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-48 OLIU circuit pack in Main slot **M1** is *not* the active circuit pack for transmission, proceed to Step 10.

If...	Then to perform an optional manual transmission switch...
UPSR,	Select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**. **Result:** A dialog box appears asking you to confirm executing this command. Click **Yes**. The system reports a `manual switch` condition for the affected path. Repeat for each path supported by the circuit pack in Main slot **M1**. Click **Close**.
BLSR,	Select **Fault** → **Protection Switch**. Click on *2F BLSR main-1-1* and **Select**. Select the *West* Direction and *Manual to Protection, Ring* Switch Type, and click **Apply**. **Result:** A dialog box appears asking you to confirm executing this command. Click **Yes** and **Close**. The **ABN** LED is lit on the SYSCTL circuit pack faceplate and the Alarm List shows the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).
1+1,	Select **Fault** → **Protection Switch**. Click on *1+1 Line main-1-1* and **Select**. Select the *Manual* Switch Type and click **Apply**. **Result:** A dialog box appears asking you to confirm executing this command. Click **Yes** and **Close**. The system reports a `manual switch` condition for the affected OC-n line.

10 If required, repeat Step 8 to verify that the OC-48 OLIU circuit pack in Main slot **M2** is now the active circuit pack for transmission.

11 **Important!** The Circuit Pack mode of the OC-48 OLIU circuit pack in Main slot **M1** must be changed first.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1** and remove the circuit pack from the slot.

Result: Transmission hits (less than 60 ms) may occur if active traffic exists on the circuit pack in Main slot **M1**. If active through traffic exists on the circuit pack in Main slot **M1**, transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped (UPSRs/BLSRs only).

12 **Important!** When the Normal/Enhanced jumper is placed in the *Normal* position, the circuit pack can cross-connect VT1.5 signals in up to any 6 STS-1 signals. When the Normal/Enhanced jumper is placed in the *Enhanced* position, the circuit pack can cross-connect VT1.5 signals in up to any 12 STS-1 signals.

Change the Normal/Enhanced jumper on the OC-48 OLIU circuit pack to the *Enhanced* position. Refer to "Normal/Enhanced jumper" (p. 4-113) for the location of the Normal/Enhanced jumper and the jumper settings.

13 Install the OC-48 OLIU circuit pack in Main slot **M1**, clean all fiber connectors, and connect the transmit and receive optical fibers.

Result: The system reports an `unexpected CP type` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

14 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs automatic protection switches. Transmission hits (less than 60 ms) occur as active traffic is automatically switched from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**. All traffic is now active on the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**.

15 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2** and remove the circuit pack from the slot.

Result: Transmission hits (less than 60 ms) may occur if active traffic exists on the circuit pack in Main slot **M2**. If active through traffic exists on the circuit pack in Main slot **M2**, transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped (UPSRs/BLSRs only).

16 **Important!** When the Normal/Enhanced jumper is placed in the *Normal* position, the circuit pack can cross-connect VT1.5 signals in up to any 6 STS-1 signals. When the Normal/Enhanced jumper is placed in the *Enhanced* position, the circuit pack can cross-connect VT1.5 signals in up to any 12 STS-1 signals.

Change the Normal/Enhanced jumper on the OC-48 OLIU circuit pack to the *Enhanced* position. Refer to "Normal/Enhanced jumper" (p. 4-113) for the location of the Normal/Enhanced jumper and the jumper settings.

17 Install the OC-48 OLIU circuit pack in Main slot **M2**, clean all fiber connectors, and connect the transmit and receive optical fibers.

Result: All alarms clear and service is restored.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

END OF STEPS

Procedure 4-23: Replace low-speed circuit pack with different type low-speed circuit pack

Overview

Use this procedure to replace:

- one unprotected *out-of-service* low-speed circuit pack in a Function/Growth group with a different type low-speed circuit pack.
- two protected *out-of-service* low-speed circuit packs in a Function/Growth group with a different type low-speed circuit pack(s).

For in-service upgrades, refer to Chapter 12, “Ring and circuit pack upgrade procedures”.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist Strap
- Replacement low-speed circuit pack(s)



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this procedure.

Steps

Complete the following steps to replace an *out-of-service* low-speed circuit pack with a different type low-speed circuit pack.

1 Log in to the node where the low-speed circuit pack(s) is to be replaced.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2



NOTICE

Service-disruption hazard

Removing a low-speed circuit pack with active traffic may result in a service interruption.

Ensure that ALL service is removed from the affected low-speed circuit pack before continuing.

From the System View, select **View** → **Cross-Connections** to obtain a current list of cross-connections and verify that no cross-connections exist on the low-speed circuit pack(s) to be removed.

If required, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete any existing cross-connections.

3 Open the faceplate latches on the affected low-speed circuit pack and remove the circuit pack from the shelf.

Result: The system reports a `CP removed` alarm for the affected slot.

If required, repeat this step for the companion circuit pack in the Function/Growth group.

4 Select **Configuration** → **Update System** → **Update All**.

Result: The `CP removed` alarm(s) clears for the affected slot(s).

The affected slot(s) appears empty (circuit pack is not shown) in the *WaveStar*® CIT System View.

5 Install the replacement low-speed circuit pack(s) in the affected slot(s).

Reference:

- Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)
- Procedure 4-6: “Install DS3/EC1 circuit packs” (p. 4-40)
- Procedure 4-8: “Install DS1/E1 circuit packs” (p. 4-47)
- Procedure 4-10: “Install TMUX circuit packs” (p. 4-53)
- Procedure 4-12: “Install 10/100 Ethernet circuit packs” (p. 4-61)
- Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)
- Procedure 4-17: “Install Fibre Channel circuit packs” (p. 4-102)
- Procedure 4-25: “Install DWDM optical multiplexer/demultiplexer circuit packs” (p. 4-131)
- Procedure 4-28: “Install 10G Muxponder circuit packs” (p. 4-137)

6 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after the circuit pack is replaced. This creates a current backup copy that includes the replacement circuit pack. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to replacing the circuit pack may result in circuit pack failures.

Back up the network element database using **Configuration** → **Software** → **Remote Backup**.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)

- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

END OF STEPS

Procedure 4-24: Change slot protection state

Overview

Use this procedure to change the Slot Protection State for a Function/Growth group equipped with low-speed OLIU circuit packs.

For information about provisioning the Slot Protection State of LNW170 100/1G FXS circuit packs, refer to Procedure 11-46: "Create/Modify/Delete link aggregation group (LAG)" (p. 11-343).

> **Important!** Only Alcatel-Lucent 1665 DMX shelves equipped with the Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs in the Main slots support changing the Slot Protection State for a Function/Growth group equipped with low-speed OLIU circuit packs.

For Fast Ethernet, Gigabit Ethernet (except LNW170 100/1G FXS), Fibre Channel, and DWDM circuit packs, the Slot Protection State is fixed Unprotected.

For DS1/E1, DS3/EC1, TMUX, and high-speed OLIU circuit packs, the Slot Protection State is fixed Protected.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Slot Protection State and low-speed OLIU circuit packs except LNW55 multirate OLIU

The Slot Protection State for all low-speed OLIU circuit packs, except the LNW55 multirate OLIU circuit pack, is dependent on the individual port Application parameters.

When the port Application parameter is provisioned to 0x1 for *all* ports on a low-speed OLIU circuit pack, the Slot Protection State changes to Unprotected. When at least one port Application parameter is provisioned for a protected application (for example, 1+1), the Slot Protection State changes to Protected.

The Slot Protection State affects both slots in the Function/Growth group.

Slot Protection State and low-speed LNW55 multirate OLIU circuit packs

The Slot Protection State for LNW55 multirate OLIU circuit packs is dependent on the individual port Signal Type parameters and Application parameters.

When either the Application parameter is provisioned to 0x1 or the Signal Type parameter is provisioned to STNA for *all* ports on the LNW55 circuit pack, the Slot Protection State changes to Unprotected. When at least one port Signal Type parameter is provisioned to an OC-n rate and the Application parameter is provisioned to a protected application (for example, 1+1), the Slot Protection State changes to Protected.

The Slot Protection State affects both slots in the Function/Growth group.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify any required circuit pack/port provisioning.
4. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to change the Slot Protection State of a Function/Growth group.

1

If changing the Slot Protection State of a Function/Growth group equipped with	Then proceed to...
low-speed OLIUs from Protected to Unprotected,	Procedure 4-24.1: "Change slot protection state to unprotected for low-speed OLIU" (p. 4-127)
low-speed OLIUs from Unprotected to Protected,	Procedure 4-24.2: "Change slot protection state to protected for low-speed OLIU" (p. 4-129)

END OF STEPS

Procedure 4-24.1: Change slot protection state to unprotected for low-speed OLIU

Steps

Complete the following steps to change the Slot Protection State from Protected to Unprotected for a Function/Growth group equipped with low-speed OLIU circuit packs:

1 **Important!** If cross-connections exist to a protected port on the affected circuit pack, the port Signal Type and Application parameters *cannot* be changed.

From the System View, select **View** → **Cross-Connections** to obtain a current list of cross-connections and verify that no cross-connections exist to protected ports on the affected circuit pack.

If required, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete any existing cross-connections to protected ports on the affected circuit pack.

2 From the System View, select **Configuration** → **Update System** → **Update All**.

3 From the System View, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

4 Find the required low-speed OLIU circuit pack, then expand the equipment list by clicking on the plus (+) sign next to the low-speed OLIU circuit pack

5 Select a port and click **Select**.

Result: The port parameters appear.

6 Provision the port Signal Type parameter **STNA** (LNW55 circuit pack only) or Application parameter **0x1** and click **Apply**.

Result: If the port Signal Type parameter is changed to STNA and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

7 If required, remove the affected pluggable transmission module and select **Configuration** → **Update System** → **Update All** to clear the `unexpected or failed Pluggable Transmission Module` alarm.

8 **Important!** Either each port Signal Type parameter must be provisioned STNA (LNW55 circuit pack only) or the port Application parameter must be provisioned 0x1 on the affected low-speed OLIU circuit pack.

If required, repeat Step 3 through Step 7 to provision the remaining ports; otherwise, click **Close**.

Result: When either the port Signal Type parameter is STNA (LNW55 circuit pack only) or the port Application parameter is 0x1 for all ports on the low-speed OLIU circuit pack, the Slot Protection State changes to Unprotected. The Slot Protection State change affects both slots in the Function/Growth group.

9 Select **View** → **Equipment** to access the affected circuit packs and verify that the Slot Protection State changed to Unprotected.

END OF STEPS

Procedure 4-24.2: Change slot protection state to protected for low-speed OLIU

Steps

Complete the following steps to change the Slot Protection State from Unprotected to Protected for a Function/Growth group equipped with low-speed OLIU circuit packs:

1 **Important!** If cross-connections exist to the ports to be provisioned on the affected circuit pack, the Slot Protection State *cannot* be changed.

From the System View, select **View** → **Cross-Connections** to obtain a current list of cross-connections and verify that no cross-connections exist on the ports to be provisioned on the affected circuit pack.

If required, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete any existing cross-connections on the ports to be provisioned on the affected circuit pack.

2 **Important!** If the affected Function/Growth group is equipped with two circuit packs that are different circuit pack types, one circuit pack must be removed before changing the Slot Protection State to Protected. Two circuit packs that are different circuit pack types are not compatible when the Slot Protection State is Protected.

If required, remove one circuit pack from the affected Function/Growth group according to local procedures.

3 From the System View, select **Configuration** → **Update System** → **Update All**.

4 From the System View, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

5 Find the required low-speed OLIU circuit pack, then expand the equipment list by clicking on the plus (+) sign next to the low-speed OLIU circuit pack

6 Select the required port and click **Select**.

Result: The port parameters appear.

7 **Important!** If the port Signal Type parameter is STNA for a port on an LNW55 multirate OLIU circuit pack, the Signal Type parameter must be provisioned for the required OC-N signal rate before the port Application parameter can be changed.

If required, provision the port Signal Type parameter and click **Apply**.

8 If required, install the pluggable transmission module in the LNW55 multirate OLIU circuit pack.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

9 **Important!** The Application parameter for at least one port on the affected low-speed OLIU circuit pack must be provisioned for a protected Application (for example, 1+1).

Provision the port Application parameter for the required protected application. Click **Apply** and **Close**.

Result: When at least one optical port has been provisioned for a protected Application (for example, 1+1) the Slot Protection State changes to Protected. The Slot Protection State change affects both slots in the Function/Growth group.

10 Select **View** → **Equipment** to access the affected circuit packs and verify that the Slot Protection State changed to Protected.

11 If required at this time, install the required protection circuit pack in the companion slot of the Function/Growth group.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

END OF STEPS

Procedure 4-25: Install DWDM optical multiplexer/demultiplexer circuit packs

Overview

Use this procedure to install LNW785 OMD5/8 8-channel low-loss DWDM Optical Mux/Demux circuit packs.

The OMD5/8 circuit pack multiplexes/demultiplexes up to 8 DWDM optical channels spaced 100 GHz apart, ranging from 1530 to 1536 nm.

Equipage guidelines (Main slots *not* equipped with Very Large Fabric circuit packs)

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group *must* be the same circuit pack type. If the circuit packs in a Function group are different circuit pack types, the system reports an `unexpected CP type` alarm and service may be impacted.

Since all DWDM-related circuit packs are considered the same circuit pack type, an OMD circuit pack may be installed in a Function/Growth group with a 10G Muxponder circuit pack.

The OMD circuit pack may be installed in any Function/Growth slot; however, it is recommended that the OMD circuit pack be installed in Function Groups A, B, C, or D because the companion circuit packs are side-by-side allowing pass-through fiber connections with special short jumpers.

Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group may be the same or different circuit pack type depending on the Slot Protection State.

For OMD circuit packs, the Slot Protection State parameter is fixed Unprotected. If the Slot Protection State is Protected and an OMD circuit pack is installed, the system reports an `unexpected CP type` alarm and service may be impacted. If the Slot Protection State is Unprotected, an OMD circuit pack may be installed in a Function/Growth group with any DWDM, Ethernet/Data, or low-speed OLIU circuit pack. The system does not support OMD circuit packs in a Function/Growth group with electrical low speed circuit packs.

If an incompatible circuit pack is installed in a Function/Growth slot, the system reports a `CP not allowed - eqpt` alarm.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

The Slot Protection State parameter can be changed from Protected to Unprotected or from Unprotected to Protected. If required, refer to Procedure 4-24: "Change slot protection state" (p. 4-125).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

A deeper shelf cover (comcode 849068358) is required for shelves equipped with OMD circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain your work instructions for this procedure.
4. Ensure that an OMD circuit pack is available for installation.
5. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install an OMD circuit pack.

1 **Important!** The OMD circuit pack may be installed in any Function/Growth slot; however, it is recommended that the OMD circuit pack be installed in Function Groups A, B, C, or D because the companion circuit packs are side-by-side allowing pass-through fiber connections with special short jumpers.

Determine the Function slots being equipped with an OMD circuit pack.

Reference:

- "Equipage guidelines (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-131)
- "Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)" (p. 4-131)

2 Ensure all optical fiber connectors and couplings are properly cleaned.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

3 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with OMD circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Verify that the shelf is equipped with the deeper shelf cover and carefully remove any caution tags that are attached to the circuit pack.

4 Open both faceplate latches and seat the OMD circuit pack in the required Function slot.

Result: The **FAULT** LED lights for approximately 2 minutes then goes off, indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

5 Is a second OMD circuit pack required in the companion Function slot?

If...	Then...
Yes	Repeat this procedure from Step 1 to install the second OMD circuit pack in the companion Function slot.
No	Verify that the companion Function slot is equipped with a circuit pack, 177D Application Blank, or LNW98 Detectable Blank circuit pack. If the companion Function slot is unequipped, insert a 177D Application Blank or LNW98 Detectable Blank circuit pack into the slot. If an LNW98 Detectable Blank circuit pack was installed, select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

6 **Important!** Pre-equipping Add/Drop Ring nodes with pass-through fiber jumpers minimizes the installation time of pass-through connections when a service is established. Constant travel to pass-through nodes is avoided when a service is added.

If required, install pass-through jumpers between the Optical Channel (OCH) ports of the OMD circuit packs in the Function Group.

7 From the System View window, click the **Alarm List** button to verify that no alarms are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit packs just installed.

8 If required, provision the Optical Transport Section (OTS) port parameters.

Reference: Procedure 4-26: "Provision optical transport signal (OTS) port" (p. 4-135)

END OF STEPS

Procedure 4-26: Provision optical transport signal (OTS) port

Overview

Use this procedure to provision an Optical Transport Section (OTS) port for service. An OTS port is comprised of up to eight multiplexed optical channels (OCH).

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain work instructions for this procedure.
3. Ensure that the required circuit pack is installed. If the circuit pack is not installed, refer to Procedure 4-25: "Install DWDM optical multiplexer/demultiplexer circuit packs" (p. 4-131) .

Steps

Complete the following steps to provision an Optical Transport Section (OTS) port for service.

1 From the System View menu, click the **Alarm List** button to verify that no alarms are present for the circuit packs to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and click (highlight) the OTS port and click **Select** at the bottom of the window.

Result: The OTS port parameters appear.

4 Provision the required OTS parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, click **Close** to exit.

END OF STEPS

Procedure 4-27: Provision optical channel (OCH) port

Overview

Use this procedure to provision an Optical Channel (OCH) port for service.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify the work instruction specify the parameters and values to be provisioned.

Steps

Complete the following steps to provision an Optical Channel (OCH) port for service.

1 From the System View menu, click the **Alarm List** button to verify that no alarms are present for the circuit packs to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and click (highlight) the OCH port and click **Select** at the bottom of the window.

Result: The OCH port parameters appear.

4 Provision the required OCH parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, click **Close** to exit.

END OF STEPS

Procedure 4-28: Install 10G Muxponder circuit packs

Overview

Use this procedure to install LNW705 XM10G/8 8-channel 10G Muxponder circuit packs.

The 10G Muxponder circuit pack multiplexes/demultiplexes up to eight of the following most common high-bandwidth client signals onto a single 10G wavelength.

- SONET OC-3, OC-12, and OC-48
- Private Line Gigabit Ethernet (1GbE)
- 1G Fibre Channel (FC100)
- 2G Fibre Channel (FC200)
- 1G Fibre Connection (FICON)
- 1G Fibre Connection Express (FICON_EXP)

Equipage guidelines (Main slots *not* equipped with Very Large Fabric circuit packs)

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group *must* be the same circuit pack type. If the circuit packs in a Function/Growth group are different circuit pack types, the system reports an `unexpected CP type` alarm and service may be impacted.

Since all DWDM-related circuit packs are considered the same circuit pack type, a 10G Muxponder circuit pack may be installed in a Function/Growth group with an OMD circuit pack.

The 10G Muxponder circuit pack may be installed in any Function/Growth slot.

Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)

If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, the circuit packs in a Function/Growth group may be the same or different circuit pack type depending on the Slot Protection State.

For 10G Muxponder circuit packs, the Slot Protection State parameter is fixed Unprotected. If the Slot Protection State is Protected and a 10G Muxponder circuit pack is installed, the system reports an `unexpected CP type` alarm and service may be impacted. If the Slot Protection State is Unprotected, a 10G Muxponder circuit pack may be installed in a Function/Growth group with any DWDM, Ethernet/Data, or low-speed OLIU circuit pack. The system does not support 10G Muxponder circuit packs in a Function/Growth group with electrical low speed circuit packs.

If an incompatible circuit pack is installed in a Function/Growth slot, the system reports a `CP not allowed - eqpt` alarm.

Select **View** → **Equipment** to access the circuit pack details and determine the value of the Slot Protection State parameter.

The Slot Protection State parameter can be changed from Protected to Unprotected or from Unprotected to Protected. If required, refer to Procedure 4-24: "Change slot protection state" (p. 4-125).

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

A deeper shelf cover (comcode 849068358) is required for shelves equipped with 10G Muxponder circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Use only Alcatel-Lucent Approved Class 1 SFP/XFP transceivers. Refer to the list of pluggable transmission modules in Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).

Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*, as required, when removing and/or installing pluggable transmission modules.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain your work instructions for this procedure.
4. Ensure that an 10G Muxponder circuit pack is available for installation.
5. Ensure that the correct pluggable transmission modules are available for installation.
6. Use the work instructions and select **View** → **Equipment** to access the circuit pack details and determine if the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

Steps

Complete the following steps to install an 10G Muxponder circuit pack.

1 **Important!** The 10G Muxponder circuit pack may be installed in any Function/Growth slot.

Determine the Function/Growth slots being equipped with an 10G Muxponder circuit pack.

Reference:

- "Equipage guidelines (Main slots not equipped with Very Large Fabric circuit packs)" (p. 4-137)
- "Equipage guidelines (Main slots equipped with Very Large Fabric circuit packs)" (p. 4-137)

2 Ensure all optical fiber connectors and couplings are properly cleaned.

Important! Signal performances may be degraded if the connections and couplings are not cleaned properly.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

3 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the optical pluggable transmission modules.

Reference: Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

4 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with 10G Muxponder circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Verify that the shelf is equipped with the deeper shelf cover and carefully remove any caution tags that are attached to the circuit pack.

5 Open both faceplate latches and seat the 10G Muxponder circuit pack in the required Function/Growth slot.

Result: The **FAULT** LED lights for approximately 2 minutes then goes off, indicating successful installation.

Select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

6 If required, install pluggable transmission modules in the circuit pack according to the work instructions.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

7 Verify that the companion Function/Growth slot is equipped with a circuit pack, 177D Application Blank, or LNW98 Detectable Blank circuit pack.

If the companion Function/Growth slot is unequipped, insert a 177D Application Blank or LNW98 Detectable Blank circuit pack into the slot.

Result: If an LNW98 Detectable Blank circuit pack was installed, select **View** → **Refresh System View** and the circuit pack appears in the *WaveStar*® CIT System View indicating successful installation.

8 From the System View window, click the **Alarm List** button to verify that no alarms are present for the ports on the circuit packs just installed.

Result: The *NE Alarm List* appears. No alarms should be present for the circuit packs just installed.

9 If required, provision the 10G Muxponder circuit pack and optical channel transport unit (OTU2) port.

Reference: Procedure 4-29: "Provision 10G Muxponder circuit pack/optical channel transport unit (OTU2) port" (p. 4-141)

END OF STEPS

Procedure 4-29: Provision 10G Muxponder circuit pack/optical channel transport unit (OTU2) port

Overview

Use this procedure to provision the 10G Muxponder circuit pack and Optical Channel Transport Unit (OTU2) port for service. An OTU2 port is comprised of up to eight SONET/GbE/Data client signals.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain work instructions for this procedure.
3. Verify that the work instructions specify the circuit pack and OTU2 port parameters/values to be provisioned.
4. Ensure that the required circuit pack is installed. If the circuit pack is not installed, refer to Procedure 4-28: "Install 10G Muxponder circuit packs" (p. 4-137) .
5. Ensure that the required pluggable transmission module is installed. Refer to Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).

Steps

Complete the following steps to provision a 10G Muxponder circuit pack and Optical Channel Transport Unit (OTU2) port for service

1 From the System View menu, click the **Alarm List** button to verify that no alarms are present for the circuit packs to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find and click (highlight) the 10G Muxponder circuit pack being provisioned, then click **Select** at the bottom of the window.

Result: The circuit pack parameters appear.

4 Provision the circuit pack parameters as required, then click **Apply** if changes were made. If no changes were made, continue with the next step to provision the OTU2 port.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

5 Click **Close** to exit or continue with the next step to provision the OTU2 port.

6 Find the circuit pack with the OTU2 port being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack.

7 Click (highlight) the required pluggable transmission module (PTM) for the OTU2 port being provisioned, then click **Select** at the bottom of the window.

8 **Important!** If connecting to an optical channel on an LNW785 OMD circuit pack, the Expected Frequency of the DWDM-compatible optics must match the OCH port frequency. If the Expected Frequency of the of the DWDM-compatible optics and the OCH port frequency are different, attempts to provision an OCH cross-connection will be denied. The frequencies are not compared if the DWDM compatible signal is terminated by a different network element (alien wavelength).

Provision the required pluggable transmission module parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, continue with the next step to provision the OTU2 port.

9 Click (highlight) the OTU2 port being provisioned, then click **Select** at the bottom of the window.

Result: The OTU2 port parameters appear.

10 Select and provision the OTU2 port parameters according to the work instructions.

11 Click **Apply** to make provisioning changes. If no changes were made, click **Close**.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

END OF STEPS

Procedure 4-30: Provision 10G Muxponder circuit pack SONET/GbE/Data client port

Overview

Use this procedure to provision the following 10G Muxponder circuit pack client ports for service.

- SONET OC-3, OC-12, and OC-48
- Private Line Gigabit Ethernet (1GbE)
- 1G Fibre Channel (FC100)
- 2G Fibre Channel (FC200)
- 1G Fibre Connection (FICON)
- 1G Fibre Connection Express (FICON_EXP)

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Required equipment" (p. 4-3) and "Before you begin" (p. 4-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify the work instruction specify the parameters and values to be provisioned.

Steps

Complete the following steps to provision 10G Muxponder circuit pack client ports for service.

1 From the System View menu, click the **Alarm List** button to verify that no alarms are present for the circuit packs/client ports to be provisioned.

Result: The *NE Alarm List* appears.

2 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

3 Find the 10G Muxponder circuit pack with the client ports being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack.

4 **Important!** If the client port Signal Type parameter is STNA (default value), the Signal Type parameter must be changed to a non-STNA value before other client port/socket parameter changes are allowed. If the client port Signal Type parameter is STNA and a pluggable transmission module is installed, the system reports an `unexpected or failed Pluggable Transmission Module` alarm.

When provisioning the client port Signal Type parameter, the system only allows changes between STNA and non-STNA values. If the client port Signal Type parameter is a non-STNA value, the Signal Type parameter must be changed to STNA before changing the Signal Type parameter to another non-STNA value.

If changing the client port Signal Type parameter...	Then...
from a non-STNA value to another non-STNA value,	Continue with the next step.
from STNA to a non-STNA value,	Proceed to Step 7.
is not required,	Proceed to Step 9.

5 Find and click (highlight) the required client port (Port 1 thru Port 8) and click **Select** at the bottom of the window.

Result: The client port parameters appear.

6 Provision the Signal Type parameter as STNA and click **Apply**.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

7 Find and click (highlight) the required client port (Port 1 thru Port 8) and click **Select** at the bottom of the window.

Result: The client port parameters appear.

8 Provision the Signal Type parameter to the required non-STNA value according to the work instructions and click **Apply**.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

9 Click (highlight) the required pluggable transmission module (PTM) associated with the client port being provisioned, then click **Select** at the bottom of the window.

Result: The pluggable transmission module parameters appear.

10 Provision the required pluggable transmission module parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made, continue with the next step.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

11 Find and click (highlight) the required client port (Port 1 thru Port 8) and click **Select** at the bottom of the window.

Result: The client port parameters appear.

12 Provision the required client port parameters according to the work instructions, then click **Apply** if changes were made. If no changes were made continue with the next step.

Result: A dialog box may appear asking you to confirm executing this command. Click **Yes** to apply changes.

13 If required, repeat this procedure to provision additional client ports for service; otherwise, click **Close** to exit.

END OF STEPS

Procedure 4-31: Add subshelf to multishelf Digital Cross-Connect System (DCS) application

Overview

Use this procedure to add a DS1 or DS3 subshelf to an existing multishelf Digital Cross-Connect System (DCS) application.

The multishelf DCS application supports adding additional DS1 and DS3 (TMUX) I/O capacity to a Alcatel-Lucent 1665 DMX system by adding DS1 and/or DS3 subshelves, while maintaining the ability to externally manage the entire system using a single TID. The multishelf DCS configuration consists of one main shelf that supports up to the following maximum number of subshelves (based on equippage):

- 12 DS1 subshelves (subshelves 2 - 13) and 1 DS3 subshelf (subshelf 14), or
- 2 DS3 subshelves (subshelves 2 - 3)

The main shelf also supports all pre-existing functionality.

DS1 subshelf

A DS1 subshelf supports up to 4 pairs of LNW801 56DS1/E1 circuit packs in the Function slots (Growth slots not used) and one pair of LNW48/50/54/203 OC-12 packs in the Main slots. If other circuit packs types are installed, the system reports an `unexpected CP type` alarm. The LNW801 circuit packs are configured for DS1 ports. E1 interfaces are not supported in this release. The OC-12 ports on the main circuit packs must be configured as a unidirectional nonrevertive 1+1 OC-12 protection group.

The cross-connections on the DS1 subshelves are fixed and provide nonblocking access in the main shelf to all 224 DS1 signals in the subshelf.

DS3 subshelf

A DS3 subshelf supports up to 4 pairs of LNW20 48TMUXDS3EC1 circuit packs in the Function slots (Growth slots not used) and one pair of LNW56/57/58/502 OC-192 packs in the Main slots. If other circuit packs types are installed, the system reports an `unexpected CP type` alarm. The ports on the LNW20 48TMUXDS3EC1 circuit packs are configured as ported DS3 ports. Both channelized and unchannelized operation is supported. EC1 interfaces are not supported in the release. The OC-192 ports on the main packs are configured as a unidirectional non-revertive 1+1 OC-192 protection group.

The cross-connections on the DS3 subshelves are fixed and provide nonblocking access in the main shelf to all 192 DS3/5376 DS1 signals in the subshelf.

Main/subshelf provisioning restrictions

The following restrictions apply when provisioning the main shelf to recognize a subshelf in a multishelf DCS application.

- The main shelf is recommended to be a Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type).
- The main shelf must be equipped with VLF OLIU circuit packs in the Main slots.
- The subshelf MAC address must not be associated with another subshelf number.
- The main shelf optical interface restrictions are:
  - Unidirectional non-revertive 1+1 OC-n protection group at a rate consistent with the specified subshelf type; OC-12 for a DS1 subshelf or OC-192 for a DS3 subshelf.
  - Not associated with another subshelf number.
  - Lines must not be provisioned line timing sources.
  - No cross-connections or test access connections on the tributaries of the main shelf optical interface.
  - Not an EDGE or ENNI port.
- The main shelf must not already be provisioned as a subshelf.
- The maximum number of subshelves is not exceeded.

The following restrictions apply when provisioning a standalone shelf to be a subshelf in a multishelf DCS application.

- The shelf must be a Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type).
- There must be no loopbacks in the shelf.
- There cannot be any cross-connections or test access connections in the shelf.
- The shelf must be a stand-alone shelf.

Privilege level

You must log in as a Privileged or General Access user to complete this procedure.

Before you begin

Before you begin this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.

3. Verify that the work instructions specify the following required information to be used when provisioning the main shelf and subshelf to be added.
   - Subshelf number of the subshelf to be added (2 - 14)
   - Subshelf type (DS1 or DS3)
   - TID of the main shelf
   - MAC address of the subshelf SYSCTL circuit pack
   - 1+1 OC-n interface on the main shelf to be connected to the subshelf.
4. Verify the TID of the main shelf. If required, at the main shelf select **Administration** → **View NE Administration** to obtain the NE Parameters.
5. Verify the MAC address of the subshelf SYSCTL circuit pack. To obtain the subshelf NE Parameters, select **Administration** → **View NE Administration** . The MAC address is the unique system ID field within the network element OSI NSAP address.

Steps

Complete the following steps to add a DS1 or DS3 subshelf to a shelf. The shelf can be a stand-alone shelf or a main shelf in an existing multi-shelf DCS system.

1 If required, equip a new Alcatel-Lucent 1665 DMX standalone shelf as a DS1 or DS3 subshelf.

Reference:

- Procedure 5-6: “Equip new Alcatel-Lucent 1665 Data Multiplexer for DS1 subshelf in multishelf Digital Cross-Connect System (DCS) application” (p. 5-43)
- Procedure 5-7: “Equip new Alcatel-Lucent 1665 Data Multiplexer for DS3 subshelf in multishelf Digital Cross-Connect System (DCS) application” (p. 5-48)

2 **Important!** The LNW55 OC3/OC12/OC48 circuit pack supports OC-12 lines connecting up to 12 DS1 subshelves.

The LNW82 OC3/OC12/OC48 OLIU circuit pack may support OC-12 lines connecting up to eight DS1 subshelves.

The LNW59 OC-192 circuit pack supports OC-192 lines connecting up to two DS3 subshelves.

The LNW504 OC-48/OC-192 circuit pack supports up to 4 OC-192 lines, two of which may be connected to DS3 subshelves.

Any low-speed OLIU circuit pack in the main shelf which supports the required interface rate may be used for a subshelf interface. However, using an OLIU circuit pack in the Growth slots maximizes the number of slots available for electrical packs with external backplane interfaces (DS1, DS3, TMUX).

At the main shelf, select **View** → **Equipment** and verify that the required OC-12 interface is available to add a DS1 subshelf or OC-192 interface is available to add a DS3 subshelf.

If required, install the necessary OLIU circuit packs and/or pluggable transmission modules at the main shelf.

Reference:

- Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)
- Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

3 **Important!** Unidirectional, nonrevertive, 1+1 OC-12 lines are required to connect the main shelf and a DS1 subshelf.

Unidirectional, nonrevertive, 1+1 OC-192 lines are required to connect the main shelf and a DS3 subshelf.

Establish the required unidirectional, nonrevertive, 1+1 OC-n line between the main shelf and each DS1 and/or DS3 subshelf.

Reference: Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3)

4 **Important!** The intershelf control communications link between the main shelf and each subshelf requires an external 100Mb hub connecting the DLAN connectors of the main shelf and each subshelf.

Connect the DLAN connector on the back of the subshelf to the required external 100 Mb hub. No special cable is required.

5 **Important!** The Command Mode parameter must be provisioned *Main*.

At the main shelf, select **Configuration** → **Create Subshelf** to provision the main shelf to add the required DS1 or DS3 subshelf.

6 **Important!** The Command Mode parameter must be provisioned *Subshelf*.

At the DS1 or DS3 subshelf, select **Configuration** → **Create Subshelf** to provision the required DS1 or DS3 subshelf parameters.

Result: You will be logged off the system during the controller reset.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

END OF STEPS

Procedure 4-32: Remove subshelf from multishelf Digital Cross-Connect System (DCS) application

Overview

Use this procedure to remove a DS1 or DS3 subshelf from an existing multishelf Digital Cross-Connect System (DCS) application.

Privilege level

You must log in as a Privileged or General Access user to complete this procedure.

Before you begin

Before you begin this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the subshelf to be removed.

Steps

Complete the following steps to remove a DS1 or DS3 subshelf from an existing multishelf Digital Cross-Connect System (DCS) application.

1 To remove the subshelf, select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete all existing cross-connections on the target subshelf.

2 To remove the subshelf, select **Configuration** → **Delete Subshelf** to remove the required DS1 or DS3 subshelf.

Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

Holdover alarm may also occur since timing mode reverts back to External. If required to silence alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

END OF STEPS

5 Node turnup procedures

Overview

Purpose

This chapter includes procedures that are necessary to equip and test a new Alcatel-Lucent 1665 Data Multiplexer for Add/Drop Multiplexer (ADM), Wideband Digital Cross-Connect System (WDCS), and dense wavelength division multiplexing (DWDM) applications.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedure, that additional equipment is listed in that procedure.

Procedure 5-1: Equip new Alcatel-Lucent 1665 Data Multiplexer for Add/Drop Multiplexer (ADM) applications

Overview

Use this procedure to initially equip and test a new Alcatel-Lucent 1665 DMX for Add/Drop Multiplexer (ADM) applications. With this configuration, the Alcatel-Lucent 1665 DMX is expected to be incorporated into a network (for example, UPSR or BLSR) using the Main OLIUs.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelf is done. It also assumes that power is applied to the shelf.

The basic purpose of this procedure is to:

- Install and test system-required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm-free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Privilege level

You must log in as a Privileged user to complete this procedure.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *NOT* perform the part of the procedure in Step 26 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

Before you begin

Before you begin this procedure:

1. Refer to “Before you begin” (p. 5-2) and “Required equipment” (p. 5-2) in this chapter.
2. Refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) information in Chapter 1, “Safety”.
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.

4. Verify that you have the proper type and code of circuit packs being installed.
5. If required, ensure that correct pluggable optical modules are available for installation. For reference, see Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).
6. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test a new Alcatel-Lucent 1665 DMX for Add/Drop Multiplexer (ADM) applications.

1 Install SYSCTL circuit pack.

Reference: Procedure 4-1: "Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf" (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or
- Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31)

4 Install high-speed OLIU circuit packs in the Main slots.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

5 Provision high-speed OLIU ports, if required at this time and not already performed.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

6 Install any required low-speed OLIU circuit packs in Function/Growth slots.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

7 Provision low-speed OLIU ports, if required at this time and not already performed in the previous step.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

8 **Important!** The system Timing Mode should be provisioned to Free Running or External to avoid Holdover alarms before the end-to-end system is established. The Timing Mode may be re-provisioned when the end-to-end system is established.

If this system is going to be line timed or externally timed and the timing reference is *not* yet available, select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*, or *External* if the external timing references are available.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

9 Install any required DS3/EC1 circuit packs.

Reference: Procedure 4-6: “Install DS3/EC1 circuit packs” (p. 4-40)

10 Provision DS3/EC1 ports, if required at this time and not already performed.

Reference: Procedure 4-7: “Provision DS3/EC1 circuit packs/ports for service” (p. 4-44)

11 Install any required DS1/E1 circuit packs.

Reference: Procedure 4-8: “Install DS1/E1 circuit packs” (p. 4-47)

12 Provision DS1/E1 ports, if required at this time and not already performed.

Reference: Procedure 4-9: “Provision DS1/E1 circuit packs/ports for service” (p. 4-50)

13 Install any required TMUX circuit packs.

Reference: Procedure 4-10: “Install TMUX circuit packs” (p. 4-53)

14 Provision TMUX ports, if required at this time and not already performed.

Reference: Procedure 4-11: "Provision TMUX circuit packs/ports for service" (p. 4-57)

15 Install any required Ethernet circuit packs.

Reference:

- Procedure 4-12: "Install 10/100 Ethernet circuit packs" (p. 4-61)
- Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

16 Provision Ethernet circuit packs/ports/VCGs, if required at this time and not already performed.

Reference: Procedure 4-14: "Provision Ethernet circuit pack/LAN port/VCG for service" (p. 4-73)

17 Install any required Fibre Channel circuit packs.

Reference: Procedure 4-17: "Install Fibre Channel circuit packs" (p. 4-102)

18 Provision Fibre Channel circuit packs/data ports/VCGs, if required at this time and not already performed.

Reference: Procedure 4-18: "Provision Fibre Channel circuit pack/Data port/VCG for service" (p. 4-106)

19



NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots on the shelf. Install 177E Apparatus Blanks or LNW97 circuit packs in any unused Main 2 slot.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

20 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48, LNW82 OC3/OC12/OC48, LNW504 OC-48/OC-192, LNW705 XM10G/8, and/or LNW785 OMD circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

If required, verify that the shelf is equipped with the deeper shelf cover.

21 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: "Perform LED test" (p. 14-90)

22 Perform local terminal transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

23 Perform local facility transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

24 Test protection switching function, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

25 Check office alarm interface by local procedure, if required.

26 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:

Perform the following to delete any cross-connections, loopbacks, or protection switches that may have been made during testing:

1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
2. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

   Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.
3. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

   If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

  The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

  From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

  Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

  A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

  Holdover alarm may also occur since timing mode reverts back to External. If required to silence the alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

  If the sockets on LNW55, LNW82, and LNW504 multirate OLIU circuit packs are equipped with pluggable transmission modules, the system reports `unexpected or failed Pluggable Transmission Module` alarms. If

desired, select **Configuration** → **Equipment** to access the affected ports and provision the port Signal Type parameter the required rate that matches the pluggable transmission module.

27 Set/Change system TID (NE name), as required.

Important! The TID is a case-insensitive character string from 1 to 20 characters and must be unique for each NE in the network.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

28 Provision optional system parameters as required from work order or office records.

Reference:

- Chapter 6, "System configuration procedures"
- Chapter 7, "System administration procedures"
- Chapter 8, "System performance monitoring procedures"
- Appendix A, "Provisionable parameters"

29 Establish Alcatel-Lucent 1665 DMX networks, when required.

Reference: Chapter 9, "Network configuration procedures"

END OF STEPS

Procedure 5-2: Equip new Alcatel-Lucent 1665 Data Multiplexer for Digital Cross-Connect System (DCS) applications (single shelf with headless mains)

Overview

Use this procedure to initially equip and test a new Alcatel-Lucent 1665 DMX for Digital Cross-Connect System (DCS) applications.

In this configuration, the Main slots are equipped with:

- two LNW80 Switch circuit packs, or
- two Very Large Fabric LNW59 OC-192, LNW82 OC3/OC12/OC48, or LNW504 OC-48/OC-192 OLIU circuit packs *without* optics. (The sockets are not equipped with pluggable transmission modules.)

Alcatel-Lucent 1665 DMX shelves equipped for DCS applications act as a central hub to allow full use of the VT switch fabric for VT type *hairpin* cross-connections among circuit packs installed in the low-speed slots. The circuit packs in the Main slots act only as a cross-connect switch fabric, therefore no cross-connections are allowed to the circuit packs installed in the Main slots. Only low-speed *hairpin* cross-connections among the low-speed circuit packs are supported on this shelf.

An Alcatel-Lucent 1665 DMX equipped with LNW80 Switch Packs supports VT mapping in 48 STS1s allowing up to 96 VT-groomed STS *hairpin* cross-connections.

An Alcatel-Lucent 1665 DMX equipped with Very Large Fabric LNW59 OC-192, LNW82 OC3/OC12/OC48, or LNW504 OC-48/OC-192 OLIU circuit packs supports VT mapping in 192 STS1s allowing up to 288 VT-groomed STS *hairpin* cross-connections.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelf is done. It also assumes that power is applied to the shelf.

The basic purpose of this procedure is to:

- Install and test system required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Privilege level

You must log in as a Privileged user to complete this procedure.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *not* perform the part of the procedure in Step 25 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

Before you begin

Before you begin this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.
4. Verify that you have the proper type and code of circuit packs being installed.
5. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test a new Alcatel-Lucent 1665 DMX for Digital Cross-Connect System (DCS) applications.

1 Install SYSCTL circuit pack.

Reference: Procedure 4-1: "Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf" (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or
- Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31)

4 **Important!** The LNW80 Switch, LNW59 OC-192 OLIU, LNW82 OC3/OC12/OC48, or LNW504 OC-48/OC-192 OLIU circuit packs are required in the Main slots for Digital Cross-Connect System (DCS) applications.

If LNW59, LNW82, or LNW504 OLIU circuit packs are installed, *pluggable transmission modules are not required*.

Install the required circuit packs in the Main slots. Do *not* equip the LNW59, LNW82, or LNW504 OLIU circuit packs with pluggable transmission modules.

There are no provisionable parameters required for the LNW80 Switch Pack.

Reference:

- Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)
- Procedure 4-16: "Install LNW80 switch pack" (p. 4-101)

5 Install any required low-speed OLIU circuit packs in Function/Growth slots.

Reference: Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17)

6 Provision low-speed OLIU ports, if required at this time and not already performed.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

7 **Important!** The system Timing Mode should be provisioned to Free Running or External to avoid Holdover alarms before the end-to-end system is established. The Timing Mode may be re-provisioned when the end-to-end system is established.

If this system is going to be line timed or externally timed and the timing reference is *not* yet available, select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*, or *External* if the external timing references are available.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

8 Install any required DS3/EC1 circuit packs.

Reference: Procedure 4-6: “Install DS3/EC1 circuit packs” (p. 4-40)

9 Provision DS3/EC1 ports, if required at this time and not already performed.

Reference: Procedure 4-7: “Provision DS3/EC1 circuit packs/ports for service” (p. 4-44)

10 **Important!** The LNW6 and LNW7 DS1 circuit pack are *not* supported when the Main slots are equipped with Very Large Fabric LNW59 or LNW82 OLIU circuit packs.

Install any required DS1/E1 circuit packs.

Reference: Procedure 4-8: “Install DS1/E1 circuit packs” (p. 4-47)

11 Provision DS1/E1 ports, if required at this time and not already performed.

Reference: Procedure 4-9: “Provision DS1/E1 circuit packs/ports for service” (p. 4-50)

12 Install any required TMUX circuit packs.

Reference: Procedure 4-10: “Install TMUX circuit packs” (p. 4-53)

13 Provision TMUX ports, if required at this time and not already performed.

Reference: Procedure 4-11: “Provision TMUX circuit packs/ports for service” (p. 4-57)

14 Install any required Ethernet circuit packs.

Reference:

- Procedure 4-12: “Install 10/100 Ethernet circuit packs” (p. 4-61)
- Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)

15 Provision Ethernet circuit packs/ports/VCGs, if required at this time and not already performed.

Reference: Procedure 4-14: “Provision Ethernet circuit pack/LAN port/VCG for service” (p. 4-73)

16 Install any required Fibre Channel circuit packs.

Reference: Procedure 4-17: “Install Fibre Channel circuit packs” (p. 4-102)

17 Provision Fibre Channel circuit packs/data ports/VCGs, if required at this time and not already performed.

Reference: Procedure 4-18: “Provision Fibre Channel circuit pack/Data port/VCG for service” (p. 4-106)

18



NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots on the shelf.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

19

Important! A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48, LNW82 OC3/OC12/OC48, LNW504 OC-48/OC-192,LNW705 XM10G/8, and/or LNW785 OMD circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

If required, verify that the shelf is equipped with the deeper shelf cover.

20 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: “Perform LED test” (p. 14-90)

21 Perform local terminal transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

22 Perform local facility transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

23 Test protection switching function, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

24 Check office alarm interface by local procedure, if required.

25 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:

  Perform the following to delete any cross-connections, loopbacks, or protection switches that may have been made during testing:

  1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
  2. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.

3. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

   If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

  The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

  From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

  Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

  A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

  Holdover alarm may also occur since timing mode reverts back to External. If required to silence alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

  If the sockets on LNW55, LNW82, and LNW504 multirate OLIU circuit packs are equipped with pluggable transmission modules, the system reports `unexpected or failed Pluggable Transmission Module` alarms. If desired, select **Configuration** → **Equipment** to access the affected ports and provision the port Signal Type parameter the required rate that matches the pluggable transmission module.

26 Set/Change system TID (NE name), as required.

Important! The TID is a case-insensitive character string from 1 to 20 characters and must be unique for each NE in the network.

Reference: Procedure 7-11: “Set/change system TID” (p. 7-36)

27 Provision optional system parameters as required from work order or office records.

Reference:

- Chapter 6, “System configuration procedures”
- Chapter 7, “System administration procedures”
- Chapter 8, “System performance monitoring procedures”
- Appendix A, “Provisionable parameters”

28 Establish Alcatel-Lucent 1665 DMX networks, when required.

Reference: Chapter 9, “Network configuration procedures”

END OF STEPS

Procedure 5-3: Equip new Alcatel-Lucent 1665 Data Multiplexer for DWDM End Terminal applications

Overview

Use this procedure to initially equip and test a new Alcatel-Lucent 1665 DMX for DWDM End Terminal applications. With this configuration, the Alcatel-Lucent 1665 DMX is expected to be incorporated into a DWDM network using the OTS port of the OMD circuit pack or the OTU2 port of the XM10G/8 circuit pack.

The OMD circuit pack transports up to eight C-band DWDM wavelengths over one DWDM OTS line. This allows Ethernet, Data, and TDM traffic groomed into the OC-192 OLIU circuit packs (with DWDM-compatible optics) and XM10G/8 circuit packs to be transported over the DWDM OTS line.

The XM10G/8 circuit pack grooms up to eight high-bandwidth SONET/GbE/Data client signals for transport over the OTU2 line.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelf is done. It also assumes that power is applied to the shelf.

The basic purpose of this procedure is to:

- Install and test system-required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm-free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Privilege level

You must log in as a Privileged user to complete this procedure.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *NOT* perform the part of the procedure in Step 17 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

Before you begin

Before you begin this procedure:

1. Refer to "Before you begin" (p. 5-2) and "Required equipment" (p. 5-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.
4. Verify that you have the proper type and code of circuit packs being installed.
5. If required, ensure that correct pluggable optical modules are available for installation. For reference, see Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).
6. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test a new Alcatel-Lucent 1665 DMX for DWDM End Terminal applications.

1 Install SYSCTL circuit pack.

Reference: Procedure 4-1: "Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf" (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or
- Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31)

4 **Important!** One or two high-speed OLIU circuit packs are required for synchronization in End Terminal applications.

Install high-speed OLIU circuit packs in the Main slots.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

5 **Important!** One OMD and/or XM10G/8 circuit pack is required for each End Terminal application.

Install the required OMD and/or XM10G/8 circuit packs in the Function/Growth slots.

Reference:

- Procedure 4-25: "Install DWDM optical multiplexer/demultiplexer circuit packs" (p. 4-131)
- Procedure 4-28: "Install 10G Muxponder circuit packs" (p. 4-137)

6 Install and provision, if required at this time, any SONET/SDH circuit packs.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

7 **Important!** The system Timing Mode should be provisioned to Free Running or External to avoid Holdover alarms before the end-to-end system is established. The Timing Mode may be re-provisioned when the end-to-end system is established.

If this system is going to be line timed or externally timed and the timing reference is *not* yet available, select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*, or *External* if the external timing references are available.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

8 Install and provision, if required at this time, any Ethernet circuit packs.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

9 Install and provision, if required at this time, any Fibre Channel circuit packs.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

10 

NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots on the shelf. Install 177E Apparatus Blanks or LNW97 circuit packs in any unused Main 2 slot.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

11 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48, LNW82 OC3/OC12/OC48, LNW504 OC-48/OC-192, LNW705 XM10G/8, and/or LNW785 OMD circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Verify that the shelf is equipped with the deeper shelf cover.

12 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: "Perform LED test" (p. 14-90)

13 Perform local terminal transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

14 Perform local facility transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

15 Test protection switching function, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

16 Check office alarm interface by local procedure, if required.

17 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:

  Perform the following to delete any cross-connections, loopbacks, or protection switches that may have been made during testing:

  1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
  2. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

     Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.
  3. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

     If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

Holdover alarm may also occur since timing mode reverts back to External. If required to silence the alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

If the LNW55, LNW82, LNW504, or LNW705 circuit packs are equipped with pluggable transmission modules, the system reports `unexpected or failed Pluggable Transmission Module` alarms. If desired, select **Configuration** → **Equipment** to access the affected ports and provision the port Signal Type parameter the required rate that matches the pluggable transmission module.

18 Set/Change system TID (NE name), as required.

Important! The TID is a case-insensitive character string from 1 to 20 characters and must be unique for each NE in the network.

Reference: Procedure 7-11: “Set/change system TID” (p. 7-36)

19 Provision optional system parameters as required from work order or office records.

Reference:

- Chapter 6, “System configuration procedures”
- Chapter 7, “System administration procedures”
- Chapter 8, “System performance monitoring procedures”
- Appendix A, “Provisionable parameters”

20 Establish the Alcatel-Lucent 1665 DMX networks, when required.

Reference: Chapter 9, “Network configuration procedures”

END OF STEPS

Procedure 5-4: Equip new Alcatel-Lucent 1665 Data Multiplexer for DWDM Add/Drop Ring applications

Overview

Use this procedure to initially equip and test a new Alcatel-Lucent 1665 DMX for DWDM Add/Drop Ring applications. With this configuration, the Alcatel-Lucent 1665 DMX is expected to be incorporated into a DWDM network using the two OTS ports of the OMD circuit packs in a Function Group.

Alcatel-Lucent 1665 DMX shelves equipped for DWDM Add/Drop Ring applications transport/reconfigure/manage up to 8 drops from two 8-channel DWDM OTS lines using manual pass-through fiber connections between two End Terminals. This allows Ethernet, Data, and TDM traffic groomed into the OC-192 OLIU circuit packs (with DWDM-compatible optics) and XM10G/8 circuit packs to be transported over the DWDM lines.

Alcatel-Lucent 1665 DMX shelves equipped for DWDM Add/Drop Ring applications can also be used for a two-line End Terminal when the pass-through fiber jumpers between the OMD circuit packs are not connected.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelf is done. It also assumes that power is applied to the shelf.

The basic purpose of this procedure is to:

- Install and test system-required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm-free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Privilege level

You must log in as a Privileged user to complete this procedure.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *NOT* perform the part of the procedure in Step 19 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

Before you begin

Before you begin this procedure:

1. Refer to "Before you begin" (p. 5-2) and "Required equipment" (p. 5-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.
4. Verify that you have the proper type and code of circuit packs being installed.
5. If required, ensure that correct pluggable optical modules are available for installation. For reference, see Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).
6. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test a new Alcatel-Lucent 1665 DMX for DWDM Add/Drop Ring applications.

1 Install SYSCTL circuit pack.

Reference: Procedure 4-1: "Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf" (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or
- Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31)

4 **Important!** One or two high-speed OLIU circuit packs are required for synchronization in Add/Drop Ring applications.

Install high-speed OLIU circuit packs in the Main slots.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

5 **Important!** Two OMD circuit packs are required in a Function group for each Add/Drop Ring application. The Optical Channel (OCH) ports of the OMD circuit packs in the Function group are required to be pre-equipped with pass-through fiber jumpers. This minimizes the installation time of pass-through connections when a service is established. Constant travel to pass-through nodes is avoided when a service is added.

Install the required OMD circuit packs in the Function group with pass-through fiber jumpers connecting the Optical Channel (OCH) ports.

Reference: Procedure 4-25: "Install DWDM optical multiplexer/demultiplexer circuit packs" (p. 4-131)

6 **Important!** OCH cross-connections to/from an OCH port are used to inform the network element about manual fiber connections. This allows the network element to enable alarm reporting and variable optical attenuators. The variable optical attenuators are enabled only when an OCH port is the destination of an OCH cross-connection.

Select **Configuration** → **OCH Cross-Connections** to access the *OCH Cross-Connection Wizard* and provision the required pass-through OCH cross-connections.

7 Install and provision, if required at this time, any LNW705 XM10G/8 circuit packs.

Reference: Procedure 4-28: "Install 10G Muxponder circuit packs" (p. 4-137)

8 Install and provision, if required at this time, any SONET/SDH circuit packs.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

9 **Important!** The system Timing Mode should be provisioned to Free Running or External to avoid Holdover alarms before the end-to-end system is established. The Timing Mode may be re-provisioned when the end-to-end system is established.

If this system is going to be line timed or externally timed and the timing reference is *not* yet available, select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*, or *External* if the external timing references are available.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

10 Install and provision, if required at this time, any Ethernet circuit packs.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

11 Install and provision, if required at this time, any Fibre Channel circuit packs.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

12



NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots on the shelf. Install 177E Apparatus Blanks or LNW97 circuit packs in any unused Main 2 slot.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

13

Important! A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48, LNW82 OC3/OC12/OC48, LNW504 OC-48/OC-192, LNW705 XM10G/8, and/or LNW785 OMD circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

Verify that the shelf is equipped with the deeper shelf cover.

14 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: "Perform LED test" (p. 14-90)

15 Perform local terminal transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

16 Perform local facility transmission tests, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)
- Procedure 14-11: "Perform EC-1 transmission test" (p. 14-82)

17 Test protection switching function, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

18 Check office alarm interface by local procedure, if required.

19 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:
  Perform the following to delete any cross-connections, loopbacks, or protection switches that may have been made during testing:
  1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
  2. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.

3. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

   If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

  The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

  From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

  Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

  A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

  Holdover alarm may also occur since timing mode reverts back to External. If required to silence the alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

  If the LNW55, LNW82, LNW504, or LNW705 circuit packs are equipped with pluggable transmission modules, the system reports `unexpected or failed Pluggable Transmission Module` alarms. If desired, select **Configuration** → **Equipment** to access the affected ports and provision the port Signal Type parameter the required rate that matches the pluggable transmission module.

20 Set/Change system TID (NE name), as required.

Important! The TID is a case-insensitive character string from 1 to 20 characters and must be unique for each NE in the network.

Reference: Procedure 7-11: “Set/change system TID” (p. 7-36)

21 Provision optional system parameters as required from work order or office records.

Reference:

- Chapter 6, “System configuration procedures”
- Chapter 7, “System administration procedures”
- Chapter 8, “System performance monitoring procedures”
- Appendix A, “Provisionable parameters”

22 Establish the Alcatel-Lucent 1665 DMX networks, when required.

Reference: Chapter 9, “Network configuration procedures”

END OF STEPS

Procedure 5-5: Equip new Alcatel-Lucent 1665 Data Multiplexer shelves for multishelf Digital Cross-Connect System (DCS) applications

Overview

Use this procedure to initially equip and test new Alcatel-Lucent 1665 DMX shelves for multishelf Digital Cross-Connect System (DCS) applications.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelves is done. It also assumes that power is applied to the shelves.

The basic purpose of this procedure is to:

- Install and test system required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *NOT* perform the part of the procedure in Step 20 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

Multishelf Digital Cross-Connect System (DCS) configuration

The multishelf DCS configuration supports adding additional DS1 and DS3 (TMUX) I/O capacity to a Alcatel-Lucent 1665 DMX system by adding DS1 and/or DS3 subshelves, while maintaining the ability to externally manage the entire system using a single TID. The multishelf DCS configuration consists of one main shelf that supports up to the following maximum number of subshelves (based on equippage):

- 12 DS1 subshelves (subshelves 2 - 13) and 1 DS3 subshelf (subshelf 14), or
- 2 DS3 subshelves (subshelves 2 - 3)

Refer to " Multishelf Digital Cross-Connect System configuration examples" (p. 5-41) at the end of this procedure for examples of multishelf DCS configurations.

The transmission link between the main shelf and each subshelf is a unidirectional non-revertive 1+1 protected OC-n line (OC-12 for a DS1 subshelf and OC-192 for a DS3 subshelf).

The intershelf control communications link between the main shelf and each subshelf requires an external 100Mb hub connecting the DLAN connectors of the main shelf and each subshelf.

Important! The multishelf DCS configuration is only supported by the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The Standard Alcatel-Lucent 1665 DMX Shelf does not support the multishelf DCS configuration.

Main shelf

Main shelves equipped with Very Large Fabric (VLF) OLIU circuit packs in the main slots may be provisioned to support subshelves. This is required to support the maximum number of available portless TMUX ports on the LNW20 48TMUXDS3EC1 circuit packs in the main shelf.

All provisionable cross-connections occur in the switch fabrics on the main shelf. Cross-connections are fixed on the subshelves.

The main shelf also supports all pre-existing functionality.

DS1 subshelf

A DS1 subshelf supports up to 4 pairs of LNW801 56DS1/E1 circuit packs in the Function slots (Growth slots not used) and one pair of LNW48/50/54/203 OC-12 packs in the Main slots. If other circuit packs types are installed, the system reports an `unexpected CP type` alarm. The LNW801 circuit packs are configured for DS1 ports. E1 interfaces are not supported in this release. The OC-12 ports on the main circuit packs must be configured as a unidirectional nonrevertive 1+1 OC-12 protection group.

The cross-connections on the DS1 subshelves are fixed and provide nonblocking access in the main shelf to all 224 DS1 signals in the subshelf.

DS3 subshelf

A DS3 subshelf supports up to 4 pairs of LNW20 48TMUXDS3EC1 circuit packs in the Function slots (Growth slots not used) and one pair of LNW56/57/58/502 OC-192 packs in the Main slots. If other circuit packs types are installed, the system reports an `unexpected CP type` alarm. The ports on the LNW20 circuit packs are configured as ported DS3 ports. Both channelized and unchannelized operation is supported. EC1 interfaces are not supported in the release. The OC-192 ports on the main packs are configured as a unidirectional non-revertive 1+1 OC-192 protection group.

The cross-connections on the DS3 subshelves are fixed and provide nonblocking access in the main shelf to all 192 DS3/5376 DS1 signals in the subshelf.

Main/subshelf provisioning restrictions

The following restrictions apply when provisioning the main shelf to recognize a subshelf in a multishelf DCS application.

- The main shelf is recommended to be a Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type).
- The main shelf must be equipped with VLF OLIU circuit packs in the Main slots
- The subshelf MAC address must not be associated with another subshelf number
- The main shelf optical interface restrictions are as follows:
  - Unidirectional non-revertive 1+1 OC-n protection group at a rate consistent with the specified subshelf type; OC-12 for a DS1 subshelf or OC-192 for a DS3 subshelf.
  - Not associated with another subshelf number.
  - Lines must not be a provisioned line timing sources.
  - No cross-connections or test access connections on the tributaries of the main shelf optical interface.
  - Not an EDGE or ENNI port.
- The maximum number of subshelves is not exceeded.
- The shelf must not already be provisioned as a subshelf.

The following restrictions apply when provisioning a standalone shelf to be a subshelf in a multishelf DCS application.

- The shelf must be a Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type).
- There must be no loopbacks in the shelf.
- There must be no cross-connections or test access connections in the shelf.
- The shelf must be a stand-alone shelf.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Before you begin this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).

3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.
4. Verify that you have the proper type and code of circuit packs being installed.
5. Verify that the work instructions specify the following required information to be used when provisioning the main shelf and subshelves:
   - Subshelf numbers (2 - 14)
   - Subshelf types (DS1 or DS3)
   - TID of the main shelf
   - MAC addresses of the subshelf SYSCTL circuit packs
   - 1+1 OC-n interfaces on the main shelf to be connected to the subshelf.
6. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test new Alcatel-Lucent 1665 DMX shelves for multishelf Digital Cross-Connect System (DCS) applications.

1 Install SYSCTL circuit packs in the Main shelf and each DS1 and/or DS3 subshelf.

Reference: Procedure 4-1: “Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf” (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session with the Main shelf.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: “Install software generic (initial) via FTAM” (p. 2-3) or
- Procedure 2-2: “Install software generic (initial) via FTP” (p. 2-31)

4 At each subshelf, repeat Step 2 and Step 3.

5 **Important!** The LNW59 OC-192 OLIU, LNW82 OC3/OC12/OC48, or LNW504 OC-48/OC-192 VLF OLIU circuit packs are required in the Main slots at the main shelf.

The LNW82 OC3/OC12/OC48 OLIU circuit pack may support OC-12 lines connecting up to eight DS1 subshelves.

The LNW59 OC-192 and LNW504 OC-48/OC-192 OLIU circuit packs may support OC-192 lines connecting up to two DS3 subshelves.

Install the required circuit packs in the Main slots at the main shelf.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

6 **Important!** Any OLIU circuit pack in the main shelf which supports the required interface rate may be used for a subshelf interface. However, using an OLIU circuit pack in the Growth slots maximizes the number of slots available for electrical packs with external backplane interfaces (DS1, DS3, TMUX).

The LNW55 OC3/OC12/OC48 circuit pack supports OC-12 lines connecting up to 12 DS1 subshelves.

Install any required low-speed OLIU circuit packs at the main shelf for the unidirectional, nonrevertive, 1+1 OC-12 lines to the required DS1 subshelves.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

7 **Important!** The LNW48, LNW50, LNW54, or LNW203 OC-12 OLIU circuit packs are required in the Main slots at a DS1 subshelf.

The LNW56, LNW57, LNW58, or LNW502 OC-192 OLIU circuit packs are required in the Main slots at a DS3 subshelf.

Install the required circuit packs in the Main slots at each DS1 and/or DS3 subshelf.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

8 **Important!** The system Timing Mode should be provisioned to Free Running or External to avoid Holdover alarms on the main shelf and subshelves before the multishelf DCS system is established. The Timing Mode may be re-provisioned on the main shelf when the multishelf DCS system is established.

In the main shelf, a port in an OC-n 1+1 protection group that is provisioned as a subshelf interface cannot be selected as a line timing input. The 1+1 interface provides timing to the subshelf. The timing parameters for a subshelf are set automatically as part of the subshelf startup procedure.

If this main shelf is going to be line timed or externally timed and the timing reference is *not* yet available, select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*, or *External* if the external timing references are available.

At each subshelf, select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

9 Install any required LNW801 56DS1/E1 circuit packs in the Function slots on the main shelf and DS1 subshelves.

Reference: Procedure 4-6: "Install DS3/EC1 circuit packs" (p. 4-40)

10 Provision DS1 ports, if required at this time and not already performed.

Reference: Procedure 4-7: "Provision DS3/EC1 circuit packs/ports for service" (p. 4-44)

11 Install any required LNW20 48TMUXDS3EC1 circuit packs in the Function slots on the main shelf and/or DS3 subshelves.

Reference: Procedure 4-10: "Install TMUX circuit packs" (p. 4-53)

12 Provision TMUX ports, if required at this time and not already performed.

Reference: Procedure 4-11: "Provision TMUX circuit packs/ports for service" (p. 4-57)

13



NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots on each shelf.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

14 **Important!** A deeper shelf cover (comcode 849068358) is required for shelves equipped with LNW55 OC3/OC12/OC48, LNW82 OC3/OC12/OC48, and/or LNW504 OC-48/OC-192OLIU circuit packs. This shelf cover provides more space to prevent fibers from touching the front cover when the cover is closed.

If required, verify that each shelf is equipped with the deeper shelf cover.

15 Perform the LED test to verify that all LEDs are operating properly on each shelf.

Reference: Procedure 14-13: "Perform LED test" (p. 14-90)

16 Perform local terminal transmission tests on each shelf, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)

17 Perform local facility transmission tests on each shelf, if required.

Reference:

- Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)
- Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)

18 Test protection switching function on each shelf, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

19 Check office alarm interface on the main shelf only by local procedure, if required.

20 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:

Perform the following to delete any cross-connections, test access cross-connections, loopbacks, or protection switches that may have been made during testing:

1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
2. Select **Fault** → **Analysis** → **Test Access** from the System View menu to access the Test Access Wizard and verify that no test access cross-connections exist. If required use the Test Access Wizard to delete any existing test access cross-connections.
3. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

   Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.
4. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

   If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

  The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

  From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

  Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

  A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

  Holdover alarm may also occur since timing mode reverts back to External. If required to silence alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

If the sockets on LNW55 or LNW82 multirate OLIU circuit packs are equipped with pluggable transmission modules, the system reports `unexpected or failed Pluggable Transmission Module` alarms. If desired, select **Configuration** → **Equipment** to access the affected ports and provision the port Signal Type parameter the required rate that matches the pluggable transmission module.

Repeat this step at each shelf.

21

Important! The entire multishelf DCS system is externally managed using a single TID.

Set/Change system TID (NE name) at the main shelf, as required.

Important! The TID is a case-insensitive character string from 1 to 20 characters and must be unique for each NE in the network.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

22

Important! Unidirectional, nonrevertive, 1+1 OC-12 lines are required to connect the main shelf and DS1 subshelves.

Unidirectional, nonrevertive, 1+1 OC-192 lines are required to connect the main shelf and DS3 subshelves.

Establish the required unidirectional, nonrevertive, 1+1 OC-n line between the main shelf and each DS1 and/or DS3 subshelf.

Reference: Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3)

23

Important! The intershelf control communications link between the main shelf and each subshelf requires an external 100Mb hub connecting the DLAN connectors of the main shelf and each subshelf.

Connect the DLAN connector on the back of each shelf to an external 100 Mb hub. No special cable is required.

24

Verify the MAC address of each subshelf. If required, at the subshelf select **Administration** → **View NE Administration** to obtain the NE Parameters. The MAC address is the unique system ID field within the network element OSI NSAP address.

25

Important! The Command Mode parameter must be provisioned *Main*.

At the main shelf, select **Configuration** → **Create Subshelf** to provision the main shelf to add the required DS1 and/or DS3 subshelves, as required.

26 **Important!** The Command Mode parameter must be provisioned *Subshelf*.

At each DS1 and/or DS3 subshelf, select **Configuration** → **Create Subshelf** to provision the DS1 or DS3 subshelf parameters, as required.

Result: You will be logged off the system during the controller reset.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

27 Provision optional system parameters as required from work order or office records.

Reference:

- Chapter 6, "System configuration procedures"
- Chapter 7, "System administration procedures"
- Chapter 8, "System performance monitoring procedures"
- Appendix A, "Provisionable parameters"

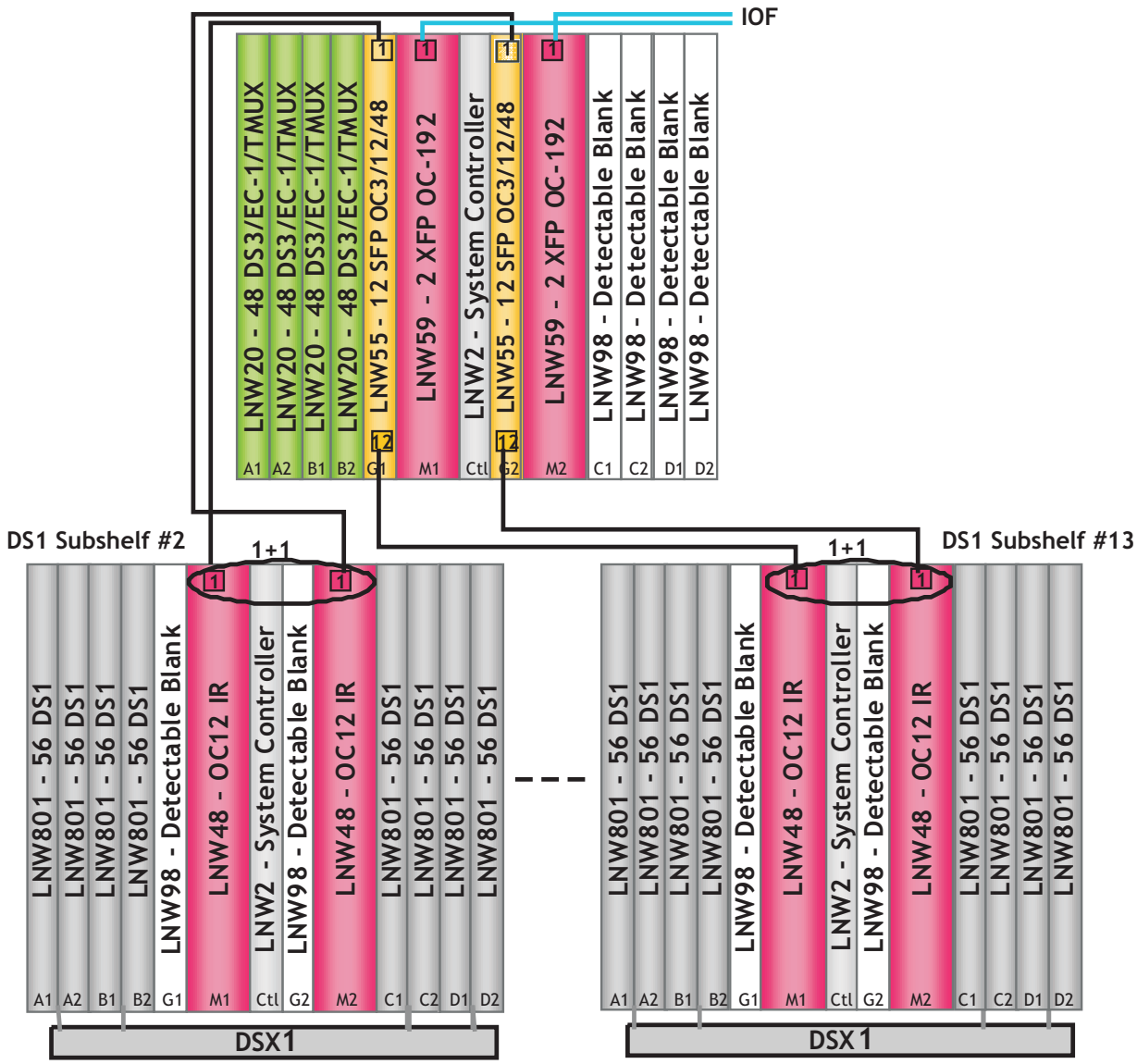
28 Establish Alcatel-Lucent 1665 DMX networks, when required.

Reference: Chapter 9, "Network configuration procedures"

END OF STEPS

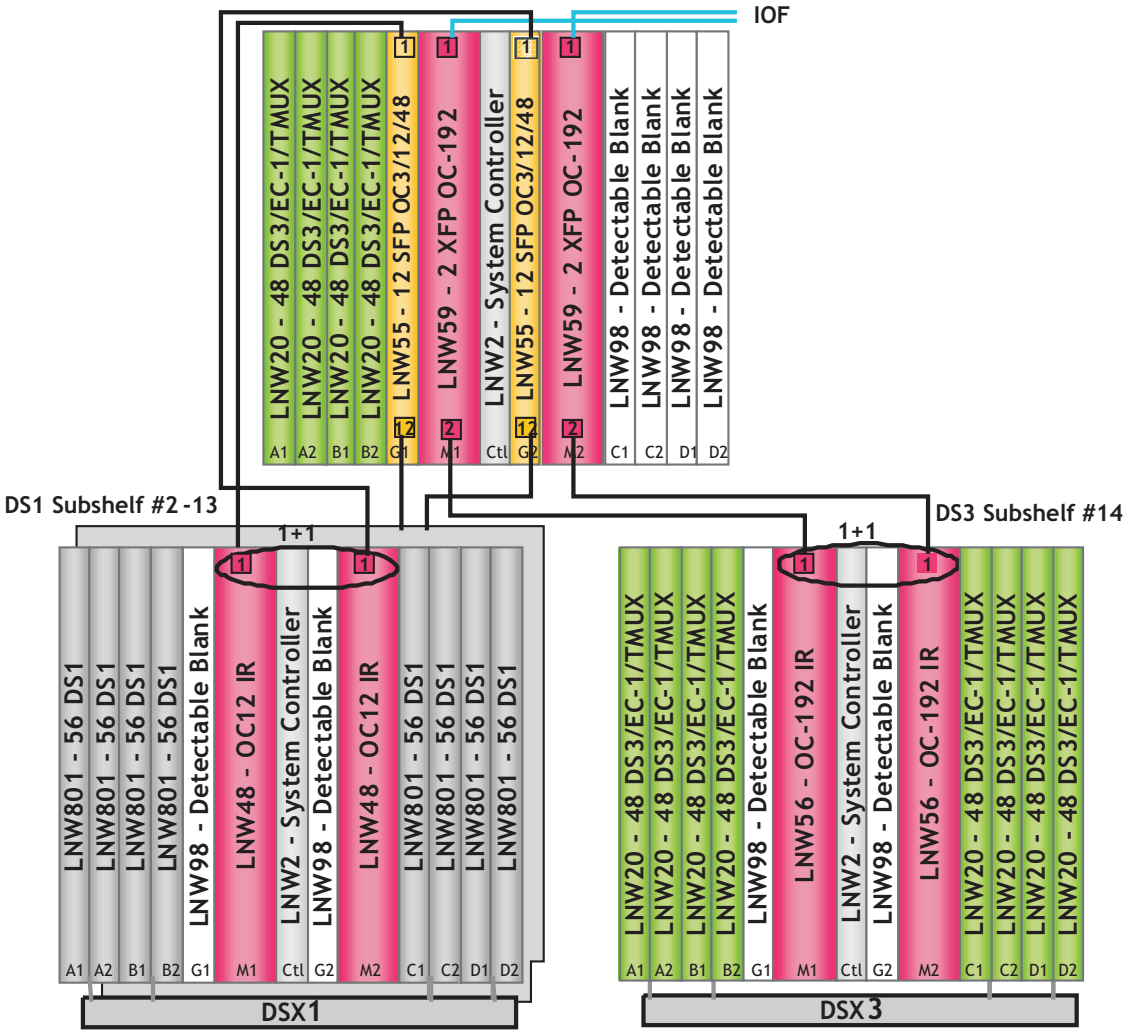
Multishelf Digital Cross-Connect System configuration examples

Figure 5-1 Multishelf DCS configuration with DS1 subshelves



multishelf-dcs-config

Figure 5-2 Multishelf DCS configuration with DS1 and DS3 subshelves



multishelf-dcs-config1

Procedure 5-6: Equip new Alcatel-Lucent 1665 Data Multiplexer for DS1 subshelf in multishelf Digital Cross-Connect System (DCS) application

Overview

Use this procedure to initially equip and test a new Alcatel-Lucent 1665 DMX for a DS1 subshelf in an existing multishelf Digital Cross-Connect System (DCS) application.

Up to 12 DS1 subshelves are supported in a multishelf DCS application.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelves is done. It also assumes that power is applied to the shelves.

The basic purpose of this procedure is to:

- Install and test system required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *NOT* perform the part of the procedure in Step 13 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

DS1 subshelf

A DS1 subshelf supports up to 4 pairs of LNW801 56DS1/E1 circuit packs in the Function slots (Growth slots not used) and one pair of LNW48/50/54/203 OC-12 packs in the Main slots. If other circuit packs types are installed, the system reports an `unexpected CP type` alarm. The LNW801 circuit packs are configured for DS1 ports. E1 interfaces are not supported in this release. The OC-12 ports on the main circuit packs must be configured as a unidirectional nonrevertive 1+1 OC-12 protection group.

The cross-connections on the DS1 subshelves are fixed and provide nonblocking access in the main shelf to all 224 DS1 signals in the subshelf.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Before you begin this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.
4. Verify that you have the proper type and code of circuit packs being installed.
5. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test a new Alcatel-Lucent 1665 DMX for a DS1 subshelf in multishelf Digital Cross-Connect System (DCS) applications.

1 Install SYSCTL circuit pack in the DS1 subshelf.

Reference: Procedure 4-1: "Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf" (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session with the DS1 subshelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or
- Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31)

4 **Important!** The LNW48, LNW50, LNW54, or LNW203 OC-12 OLIU circuit packs are required in the Main slots at a DS1 subshelf.

Install the required circuit packs in the Main slots at the DS1 subshelf.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

5 **Important!** The system Timing Mode should be provisioned to Free Running to avoid Holdover alarms before adding the DS1 subshelf to the multishelf DCS system. The timing parameters for a subshelf are set automatically as part of the subshelf startup procedure.

Select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 Install any required LNW801 56DS1/E1 circuit packs in the Function slots on DS1 subshelf.

Reference: Procedure 4-6: "Install DS3/EC1 circuit packs" (p. 4-40)

7 Provision DS1 ports, if required at this time and not already performed.

Reference: Procedure 4-7: "Provision DS3/EC1 circuit packs/ports for service" (p. 4-44)

8 

NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

9 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: "Perform LED test" (p. 14-90)

10 Perform local terminal transmission tests, if required.

Reference: Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)

11 Perform local facility transmission tests, if required.

Reference: Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)

12 Test protection switching function, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

13 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:
  Perform the following to delete any cross-connections, test access cross-connections, loopbacks, or protection switches that may have been made during testing:
  1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
  2. Select **Fault** → **Analysis** → **Test Access** from the System View menu to access the Test Access Wizard and verify that no test access cross-connections exist. If required use the Test Access Wizard to delete any existing test access cross-connections.
  3. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.

4. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

   If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

  The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

  From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

  Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

  A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

  Holdover alarm may also occur since timing mode reverts back to External. If required to silence alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

14 Add the DS1 subshelf to the existing multishelf DCS application, when required.

Reference: Procedure 4-31: “Add subshelf to multishelf Digital Cross-Connect System (DCS) application” (p. 4-147)

END OF STEPS

Procedure 5-7: Equip new Alcatel-Lucent 1665 Data Multiplexer for DS3 subshelf in multishelf Digital Cross-Connect System (DCS) application

Overview

Use this procedure to initially equip and test a new Alcatel-Lucent 1665 DMX for a DS3 subshelf in an existing multishelf Digital Cross-Connect System (DCS) application.

Up to two DS3 subshelves are supported in a multishelf DCS application.

This procedure assumes that all hardwired installation and testing of the unequipped Alcatel-Lucent 1665 DMX shelves is done. It also assumes that power is applied to the shelves.

The basic purpose of this procedure is to:

- Install and test system required circuit packs and software.
- Install and test optional circuit packs that you want to install at initial installation.
- Test the Alcatel-Lucent 1665 DMX for proper and alarm free operation before placing into the network.

Additional references are provided at the end of this procedure for provisioning optional system and circuit pack port parameters.

Important! Some of the steps and procedures referenced in this procedure provide information on provisioning port parameters. If you provision parameters after installing each circuit pack, then you should *NOT* perform the part of the procedure in Step 13 to reset all provisionable parameters to default values.

Depending on local procedures, you may set the circuit pack and/or port parameters in this procedure, or reference the appropriate procedures in this document when you are ready to establish your network and service configurations.

DS3 subshelf

A DS3 subshelf supports up to 4 pairs of LNW20 48TMUXDS3EC1 circuit packs in the Function slots (Growth slots not used) and one pair of LNW56/57/58/502 OC-192 packs in the Main slots. If other circuit packs types are installed, the system reports an `unexpected CP type` alarm. The ports on the LNW20 circuit packs are configured as ported DS3 ports. Both channelized and unchannelized operation is supported. EC1 interfaces are not supported in the release. The OC-192 ports on the main packs are configured as a unidirectional non-revertive 1+1 OC-192 protection group.

The cross-connections on the DS3 subshelves are fixed and provide nonblocking access in the main shelf to all 192 DS3/5376 DS1 signals in the subshelf.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Before you begin this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).
3. Obtain the work instructions for this procedure which state the quantity and type of circuit packs to be installed.
4. Verify that you have the proper type and code of circuit packs being installed.
5. If system and circuit pack port parameters are being set at this time, ensure you have a full set of work instructions detailing the values of the parameters being set.

It is suggested that you first install and test all the required circuit packs, perform the necessary system tests, reset all provisionable parameters to factory default values, then provision system and port parameters from values given in your work instructions.

Steps

Complete the following steps to initially equip and test a new Alcatel-Lucent 1665 DMX for a DS3 subshelf in an existing multishelf Digital Cross-Connect System (DCS) application.

1 Install SYSCTL circuit pack in the DS3 subshelf.

Reference: Procedure 4-1: "Install SYSCTL (LNW2) in new Alcatel-Lucent 1665 DMX shelf" (p. 4-4)

2 Connect personal computer and establish *WaveStar*® CIT session with the DS3 subshelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Install system software, if required.

Reference:

- Procedure 2-1: "Install software generic (initial) via FTAM" (p. 2-3) or
- Procedure 2-2: "Install software generic (initial) via FTP" (p. 2-31)

4 **Important!** The LNW56, LNW57, LNW58, or LNW502 OC-192 OLIU circuit packs are required in the Main slots at a DS3 subshelf.

Install the required circuit packs in the Main slots at the DS3 subshelf.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

5 **Important!** The system Timing Mode should be provisioned to Free Running to avoid Holdover alarms before adding the DS3 subshelf to the multishelf DCS system. The timing parameters for a subshelf are set automatically as part of the subshelf startup procedure.

Select **Configuration** → **Timing/Sync** to provision the system Timing Mode to *Free Running*.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 Install any required LNW20 48TMUXDS3EC1 circuit packs in the Function slots.

Reference: Procedure 4-10: "Install TMUX circuit packs" (p. 4-53)

7 Provision TMUX ports, if required at this time and not already performed.

Reference: Procedure 4-11: "Provision TMUX circuit packs/ports for service" (p. 4-57)

8 

NOTICE

Service-disruption hazard

Improperly-seated circuit packs or missing apparatus blanks may cause service hits on in-service systems.

All slots in Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks to prevent service hits on in-service systems.

Install 177D Apparatus Blanks or LNW98 circuit packs in any unused Function/Growth slots.

Important! All slots in the Alcatel-Lucent 1665 DMX must be equipped with fully-seated circuit packs or apparatus blanks.

9 Perform the LED test to verify that all LEDs are operating properly.

Reference: Procedure 14-13: "Perform LED test" (p. 14-90)

10 Perform local terminal transmission tests, if required.

Reference: Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)

11 Perform local facility transmission tests, if required.

Reference: Procedure 14-10: "Perform DS3 transmission test" (p. 14-76)

12 Test protection switching function, if required.

Reference: Procedure 14-12: "Test function unit equipment protection switching" (p. 14-88)

13 Perform *one* of the following depending on whether or not you have already provisioned circuit packs and ports for service:

- Circuit packs and/or ports *were* provisioned in this procedure:

  Perform the following to delete any cross-connections, test access cross-connections, loopbacks, or protection switches that may have been made during testing:

  1. Select **View** → **Cross-Connections** from the System View menu. Select **Shelf** from the View Cross Connections window, then click **Select**. Print or save the cross-connections to be deleted, then click **Close**. Select **Configuration** → **Cross-Connections** from the System View window to start the Cross Connection Wizard. Follow the instruction in the Wizard to delete the necessary cross-connections.
  2. Select **Fault** → **Analysis** → **Test Access** from the System View menu to access the Test Access Wizard and verify that no test access cross-connections exist. If required use the Test Access Wizard to delete any existing test access cross-connections.
  3. Select **View** → **Loopback** from the System View menu. Select **Shelf** from the View Loopbacks window, then click **Select**. Print or save the existing loopbacks to be released, then click **Close**.

Select **Fault** → **Analysis** → **Loopback** from the System View menu. Expand the details in the Loopback window, select the port with the loopback to be released, then click **Select**. Select Release and the Loopback Type, then click **Apply** at the bottom of the Loopback window. Click **Yes** to the Warning message to release the loopback. Click **Close** to exit.

4. Select **View** → **Protection** from the System View menu. Select the required protection group, then click **Select**. Note the Protection Switch State. Repeat for each protection group, then click **Close**.

   If required, select **Fault** → **Protection Switch** from the System View menu to access the required protection group and clear any protection switches. Click **Apply** and click **Yes**. If required, repeat for each protection group, then click **Close**.

- Circuit packs and/or ports *were not* provisioned in this procedure:

  The following command resets all system provisionable parameters and cross-connections to factory default values. If you have already set provisionable parameters for the installed circuit packs/ports, they will be reset to factory default values.

  From the System View menu, select **Fault** → **Reset** → **Initialize System** to reset system parameters to default values, if required. Read all the warnings and follow the prompts to execute the command.

  Result: You will be logged off the system during the controller reset and provisionable parameters will be set to factory default.

  A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

  Holdover alarm may also occur since timing mode reverts back to External. If required to silence alarm, select **Configuration** → **Timing/Sync** and provision the system timing mode to Free Running.

14 Add the DS3 subshelf to the existing multishelf DCS application, when required.

Reference: Procedure 4-31: “Add subshelf to multishelf Digital Cross-Connect System (DCS) application” (p. 4-147)

END OF STEPS

6 System configuration procedures

Overview

Purpose

This chapter includes procedures used to provision system configuration parameters, for example, timing, DCC terminations, miscellaneous discretes.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedure, that additional equipment is listed in that procedure.

Procedure 6-1: Provision system configuration parameters

Overview

Use this procedure as reference for provisioning optional system configuration parameters from the System View **Configuration** menu.

Depending on your requirements, default settings may be sufficient for many of the parameters. Other parameters in the Configuration menu are necessary for system and network operation but may not be listed here. They are accessed through various procedures associated with system turn-up, network configuration, and establishing service.

Configuration parameters may consist of provisioning one or more of the following:

- General system (aid=system), circuit pack, port, and tributary parameters
- Network connections
- Ethernet/Data service
- Miscellaneous discretes
- DCC terminations
- Timing and synchronization functions
- Alarm configurations
- Software and database functions

Depending on local procedures, types of configurations, and shelf equipage, some or none of the optional parameters may need to be set. It is assumed that local system administration is responsible for determining these parameter settings.

Some of the parameter values may be set during the initial shelf turn-up. Other parameter values may be set after the system is integrated into the network configuration.

Steps

Use the sections in this procedure as reference for provisioning optional system configuration parameters.

1 Reference the sections in this procedure to provision the required system configuration parameters from your work instructions.

Important! Some of the parameters may have already been provisioned from earlier procedures.

END OF STEPS

System, circuit packs, ports, or tributaries

Refer to the following to provision system, port, and tributary parameters that may apply to the entire system or a circuit pack. Certain individual parameters may be provisioned in other procedures depending on the type of service, system configuration, and/or network configuration.

Configuration → Equipment

Procedure 6-2: "Provision shelf/system parameters" (p. 6-8)

Chapter 4, "Install and provision circuit packs/OLIUs procedures"

For other system parameters, including system date and time, NE defaults, Target Identifier (TID)/NE Name, and Login banner, see Chapter 7, "System administration procedures".

Multishelf Digital Cross-Connect System (DCS) subshelves

Refer to the following to provision multishelf DCS subshelves

Configuration → Create Subshelf

Configuration → Delete Subshelf

Chapter 4, "Install and provision circuit packs/OLIUs procedures"

Cross-connections

Use for *reference only*. Refer to the following to access the Cross-Connection Wizard and provision cross-connections.

Configuration → Cross-Connections

The Cross-Connection wizard is referenced in other procedures relating to establishing specific services. If you have explicit work instructions and are familiar with the Cross-Connection Wizard, use the wizard to provision cross-connections.

Optical channel cross-connections

Use for *reference only*. Refer to the following to access the OCH Cross-Connection Wizard and provision optical channel cross-connections.

Configuration → OCH Cross-Connections

The OCH Cross-Connection wizard is referenced in other procedures relating to establishing specific services. If you have explicit work instructions and are familiar with the OCH Cross-Connection Wizard, use the wizard to provision optical channel cross-connections.

Control plane network connections

Refer to the following to provision control plane network connections.

Configuration → Create Control Plane Network Connections

Configuration → Delete Control Plane Network Connections

Chapter 9, "Network configuration procedures"

Backplane bandwidth

Refer to the following to optimize the backplane bandwidth.

Configuration → Optimize Backplane Bandwidth

Procedure 6-12: "Optimize backplane bandwidth" (p. 6-44)

Fibre Channel

Refer to the following to provision Ethernet virtual switches, VLANs, port tags, spanning tree groups, MAC addresses, and quality of service parameters.

Configuration → Data

Chapter 11, "Ethernet/Data network provisioning procedures"

Ethernet service

Refer to the following to access the Ethernet Service Wizard and provision Ethernet service.

Configuration → Ethernet Service

Chapter 11, "Ethernet/Data network provisioning procedures"

Miscellaneous discretes

Refer to the following to provision miscellaneous discrete environmental inputs and control outputs.

Configuration → Misc. Discretes

Procedure 6-3: "Provision miscellaneous discrete inputs and outputs" (p. 6-10)

DCC terminations

Refer to the following to provision DCC Terminations.

Configuration → DCC Terminations

Procedure 6-4: "Provision DCC terminations" (p. 6-12)

Timing/sync

Refer to the following to provision system timing/synchronization functions.

Configuration → Timing/Sync

Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

Alarms

Refer to the following to provision alarm severity assignment profiles and the system alarm configuration.

Configuration→ Alarms → Alarm Severity Assignment Profile

Configuration→ Alarms → Alarm Configuration

Procedure 6-6: “Provision system alarm configuration” (p. 6-31)

Procedure 6-7: “Provision new alarm severity assignment profile” (p. 6-32)

Procedure 6-8: “Change existing alarm severity assignment profile” (p. 6-34)

Procedure 6-9: “Delete alarm severity assignment profile” (p. 6-37)

Update system

Refer to the following to update the system database to reflect the current configuration and incoming signals.

Configuration → Update System → Update Inventory

Configuration → Update System → Update Reference

Configuration → Update System → Update States

Configuration → Update System → Update All

Configuration → Update System → Upgrade

These commands are referenced in procedures throughout this guide.

Normal/ring upgrade mode

Refer to the following to switch between normal and ring upgrade modes. The Normal/Ring Update Mode is used during a hardware upgrade of OCN circuit packs in a ring.

Configuration → Normal Mode

Configuration → Ring Upgrade Mode

Chapter 12, “Ring and circuit pack upgrade procedures”

Software

Refer to the following to provision system software and database functions.

Configuration → Software → Remote Backup

Configuration → Software → Remote Restore

Configuration → Software → Configure Auto Backup Interval

Configuration → Software → Copy Software

Configuration → Software → Apply Software

Configuration → Software → Download Software

Chapter 2, “Software installation and upgrades, and database backup procedures”

Procedure 6-2: Provision shelf/system parameters

Overview

Use this procedure to provision the following types of parameters that apply to the entire shelf/system.

- General system-level parameters
- Signal threshold levels for all system signal rates
- Node-level control plane parameters

Privilege level

You must login as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision shelf/system parameters.

1 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Select (highlight) **DMX** or enter **`system`** in the **Enter AID** box, then click **Select** at the bottom of the window.

Result: The provisionable system parameters appear.

3 If required, select the **System Data** tab and provision the general system parameters according to the work instructions.

Refer to the *WaveStar*® CIT on-line help for a description of the general system parameters and the provisionable values.

4 If required, select the **Signal Threshold** tab and provision the Signal Degrade and Signal Failure thresholds according to the work instructions.

Refer to the *WaveStar*® CIT on-line help for a description of the Signal Threshold parameters and the provisionable values.

5 If required, select the **ENNI** tab and provision the node-level control plane parameters according to the work instructions.

Refer to the *WaveStar*® CIT on-line help for a description of the node-level control plane parameters and the provisionable values.

6 Click **Apply** to make the changes. If no changes were made, go to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** to apply the changes.

7 Click **Close** at the bottom of window to exit.

END OF STEPS

Procedure 6-3: Provision miscellaneous discrete inputs and outputs

Overview

Use this procedure to:

- Provision miscellaneous discrete inputs and outputs
- Operate/release miscellaneous discrete outputs

Privilege level

You must log in as a Privileged or General user to provision miscellaneous discretes input and outputs. You must log in as a Privileged, General, or Maintenance user to operate/release a miscellaneous discrete output.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the miscellaneous discrete names and alarm information required for provisioning.

Steps

Complete the following steps to provision miscellaneous discretes.

1

If...	Then...
provisioning miscellaneous discrete inputs and/or outputs	Continue with Step 2.
operating/releasing a miscellaneous discrete output,	Proceed to Step 6.

2 PROVISION MISCELLANEOUS DISCRETES

From the System View menu, select **Configuration** → **Misc Discretes**.

Result: The *Configure Miscellaneous Discretes* window opens.

3 Expand the appropriate *Input* or *Output* list (according to the work instructions) by clicking on the plus sign (+). Select an available Input/Output to provision or edit (according to the work instructions) and click **Select**.

Result: The miscellaneous discrete parameters appear.

4 Provision the miscellaneous discrete input/output parameters according to the work instructions and click **Apply**.

5 If required, repeat Step 3 and Step 4 to provision other miscellaneous discrete inputs/outputs; otherwise, click **Close** to exit.

STOP! End of Procedure.

6 OPERATE/RELEASE MISCELLANEOUS DISCRETE OUTPUT

From the System View menu, select **Fault** → **Operate Output Misc. Discrete**.

Result: The *Operate Miscellaneous Discrete Outputs* window opens.

7 Expand the *Output* list by clicking on the plus sign (+). Select the required output and click **Select**.

8 Select **Operate Control Point** to operate the output, or select **Release Control Point** to turn off the output. Click **Apply**.

9 If required, repeat Step 7 and Step 8 to operate/release other miscellaneous discrete outputs; otherwise, click **Close** to exit.

END OF STEPS

Procedure 6-4: Provision DCC terminations

Overview



NOTICE

Service-disruption hazard

Changing the DCC termination parameters may affect system operations.

Do not change the DCC termination parameters on an in-service system unless you are directed to do so from another procedure.

Use this procedure to provision the DCC termination parameters for an OC-N port.

Important! The DCC termination parameters are generally provisioned when the system/optical span is integrated into a network.

Privilege level

You must login as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure,

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the OC-N port address and the required DCC termination parameter settings.

Steps

Perform the following steps to provision the DCC termination parameters for an OC-N port.

1 Using the work instructions, determine whether *OSI over DCC* or *IP over DCC* is to be provisioned for the required OC-N port.

If...	Then...
IP over DCC is to be provisioned for the OC-N port,	Continue with Step 2.
OSI over DCC is to be provisioned for the OC-N port,	Proceed to Step 7.

2 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

3 Click on the **TCP/IP** tab and select *DCC-ALL* from the **Port AID:** drop-down menu.

4 **Important!** When *IP over DCC* is enabled for DCC ports, each DCC port does not require a unique IP address. IP over DCC interfaces are also referred to as *unnumbered lines*. Although each unnumbered line does not have a unique IP address, the network element must have the TCP/IP function enabled for the Port AID *DCC-ALL* and an IP address must be assigned. The IP address assigned to the *DCC-ALL* AID is used as the router ID for unnumbered lines. For DCC links that require the local network element and the far-end network element to be in the same subnet, the *DCC-ALL* AID of the local network element must have an IP address that is in the same subnet as the IP address of the far-end network element.

Enable the **TCP/IP Function** parameter, provision the **IP Address** according to your work instructions, and provision the **IP Subnet Mask** to be 255.255.255.255. (When your Port AID is *DCC-ALL*, your IP subnet mask must be 255.255.255.255.) Click **Apply**.

Result: A *WaveStar*® CIT Warning appears stating that executing this command will cause the system view to close and may cause the system to reset, then asks you to confirm executing this command.

5 Click **Yes** to execute the command.

Result: The *WaveStar*® CIT disconnects from the network element.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

If automatic synchronization is unsuccessful, the date and time must be reset manually. If required, refer to Procedure 7-10: “Set date and time” (p. 7-31).

6 Re-establish the log in session to the network element.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

7 From the System View menu, select **Configuration** → **DCC Terminations**.

Result: The *Configure DCC Terminations* window opens.

8 Select the required DCC Port being provisioned from the **Port AID:** drop-down menu.

9 **Important!** The DCC Channel Parameters are generally provisioned when the system/optical span is integrated into a network and should not be changed unless you are reconfiguring the network and have been directed to do so.

Provision the DCC Channel Parameters according to the work instructions and click **Apply**.

Important! The **LAPD Role** parameter is not applicable if **IP Over DCC** is *enabled*.

If **OSI Over DCC** is *enabled*, the **LAPD Role** parameter must be provisioned differently at each end of an optical span. For example, if the **LAPD Role** parameter is provisioned to *user-side* at one end of an optical span, then the **LAPD Role** parameter must be provisioned *network-side* at the other end of the optical span.

10 If required, repeat Step 8 and Step 9 to provision other DCC ports; otherwise, click **Close** to exit.

END OF STEPS

Procedure 6-5: Network Element synchronization provisioning

Overview

Use this procedure to provision the network element synchronization functions.

To configure a network for the flow of valid timing signals between network elements under normal and failure conditions requires a well thought out synchronization plan. This procedure assumes such a synchronization plan exists and describes how to configure a network element accordingly.

Important! Because the initial timing mode is External, the network element enters the holdover mode if no timing input reference signals are available at turnup.

If the timing input reference signals are applied but the timing input reference signal format is improperly provisioned, the network element enters the holdover mode and an `inc. sync. ref. LOF` alarm is reported.

System synchronization characteristic

When the Main slots are equipped with Very Large Fabric (VLF) circuit packs, the network element supports provisionable SONET or SDH system synchronization. When the System Synchronization Characteristic parameter is provisioned to SONET, DS1 timing references, SONET sync status messages, and SONET synchronization characteristics apply. When the System Synchronization Characteristic parameter is provisioned to SDH, E1 timing references, SDH sync status messages, and SDH synchronization characteristics apply as specified in ITU-T GR.813 Option 1. When the Main slots are equipped with non-VLF circuit packs, the network element supports SONET system synchronization only.

The System Synchronization Characteristic parameter is generally provisioned when the system is integrated into a network and should not be changed unless you are reconfiguring the network and have been instructed to do so. If the System Synchronization Characteristic parameter of an in-service system is changed, circuit pack failures and service interruptions may occur.

Since there are different parameters and values associated with SONET and SDH synchronization, the provisioned values associated with the external timing references and the synchronization status messages revert to the appropriate defaults when the System Synchronization Characteristic parameter is changed.

Important! If the External timing mode is provisioned and the System Synchronization Characteristic is changed, the expected timing input reference signal, if previously valid, would no longer match the expected characteristics and a timing input reference signal failure is declared.

If the External or Line timing mode is provisioned with timing output reference signals and the System Synchronization Characteristic is changed, the network elements that use timing output reference signal would declare a timing input reference signal failure.

Since the interpretation of the synchronization status message S1 byte is different for SONET and SDH, the changed interpretation of the incoming synchronization status messages and the changed outgoing synchronization status messages also cause alarms/conditions to be reported at the local network element and at the connected network elements.

Beginning in Release 9.1, the initial default state of the DS1 external timing source is in-service (IS). Now, if the external timing source is invalid or missing, the system declares two alarms, **`inc. DS1 sync. ref. LOS`** and **`holdover mode active`** . Prior to 9.1, the default state of the timing source was AUTO and the external timing source was not alarmed.

Timing modes

Alcatel-Lucent 1665 DMX supports the following provisionable timing modes to synchronize all synchronous outgoing signals:

- Free Running: In the Free Running timing mode, the network element derives timing from the internal Stratum 3 Traceable (ST3) clock.
- External: In the External timing mode, the network element derives timing from one of the two timing input reference signals.
- Line: In the Line timing mode, the network element derives timing from one incoming OC-n line.

Timing output signals

Timing output reference signals to external equipment are supported when the network element is provisioned to the External or Line timing mode. In the External and Line timing modes, Output Timing can be Enabled or Disabled. Timing output signals are not supported in the Free Running timing mode. The timing output reference signals are derived from the provisioned OC-n line timing source.

When the Main slots are equipped with VLF circuit packs, DS1 or E1 timing output reference signals are supported. When the System Synchronization Characteristic parameter is provisioned to SONET, DS1 timing references are supported. When the System Synchronization Characteristic parameter is provisioned to SDH, E1 timing references are supported.

When the Main slots are equipped with non-VLF circuit packs, only DS1 timing output reference signals are supported.

Clock mode switching

Revertive or nonrevertive clock mode switching is supported in the External or Line timing mode. When revertive clock mode switching is provisioned, the network element automatically exits holdover mode (reverts) when the fault condition clears. When nonrevertive clock mode switching is provisioned, the network element remains in holdover.

Reference switching

Revertive or nonrevertive reference switching is supported in the External or Line timing mode. Synchronization Autoreconfiguration must be enabled when the network element is provisioned to the Line timing mode. Reference switching is not supported when Synchronization Autoreconfiguration is disabled and the timing mode is Line timing.

The Reference Switching parameter determines whether or not the system reverts to the provisioned primary reference (Revertive-1 or Revertive-2) when the fault condition clears.

If the Reference Switching parameter is provisioned to Revertive-1, the circuit pack/port in Main/Function/Growth slot 1 (Line) or Ref-1 (External) is designated primary.

If the Reference Switching parameter is provisioned to Revertive-2, circuit pack/port in Main/Function/Growth slot 2 (Line) or Ref-2 (External) is designated primary.

If the Reference Switching parameter is provisioned to Nonrevertive, the network element does not revert to the original active reference when the fault condition clears.

When a manual revertive reference switch is performed, the system reports a `manual reference switch` standing condition indicating a revertive reference switch is active. A manual reference switch reset must be performed to switch back to the designated primary reference and clear the `manual reference switch` standing condition. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

When a manual nonrevertive reference switch is performed, the system does not report any standing conditions or alarms since both references are designated for service.

Synchronization autoreconfiguration

Synchronization autoreconfiguration is supported on OC-n line references and external timing input/output references.

Synchronization autoreconfiguration on OC-n line references is supported when Sync messaging is enabled on the OC-n ports provisioned as optical synchronization sources. Sync messaging must be enabled on the OC-n ports prior to enabling Synchronization Autoreconfiguration. It is recommended that Synchronization Autoreconfiguration be enabled to provide the most reliable network synchronization.

When Synchronization Autoreconfiguration is enabled on OC-n line references, the system automatically reconfigures between line timing sources when the active timing source fails or a higher quality Sync Status Message is available on the other source. The switch is revertive or nonrevertive depending on the provisioned value of the Reference Switching parameter.

When Synchronization Status Message (SSM) support is enabled on external timing input/output references, the system automatically reconfigures between the two companion timing reference input and output signals when the active signal fails or a higher quality Sync Status Message is available on the other signal. The switch is revertive or nonrevertive depending on the provisioned value of the Reference Switching parameter.

Synchronization Status Messages on DS1 external references are only supported when the ESF frame format is provisioned. Synchronization Status Messages on E1 external references are only supported when the CRC4 frame format is provisioned.

When the Main slots are equipped with VLF circuit packs, SONET or SDH synchronization status messages and quality levels are supported. When the System Synchronization Characteristic parameter is provisioned to SONET, SONET synchronization status messages and quality levels are supported. When the System Synchronization Characteristic parameter is provisioned to SDH, SDH synchronization status messages and quality levels are supported.

When the Main slots are equipped with non-VLF circuit packs, only SONET synchronization status messages and quality levels are supported.

If Synchronization Autoreconfiguration is disabled, the system enters into holdover when the active timing source fails or the Sync Status Message quality level falls below the provisioned level.

Privilege level

You must login as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure and ensure that a synchronization plan exists for the system.

Steps

Complete the following steps to provision network synchronization.

1 Determine which system timing mode is to be provisioned and proceed to the appropriate procedure:

If...	Then...
Free Running	Proceed to Procedure 6-5.1: "Provision Free Running timing mode" (p. 6-20).
External	Proceed to Procedure 6-5.2: "Provision External timing mode" (p. 6-21).
Line	Proceed to Procedure 6-5.3: "Provision Line timing mode" (p. 6-23).
External with Output Timing	Proceed to Procedure 6-5.4: "Provision External timing mode with Output Timing" (p. 6-25).
Line with Output Timing	Proceed to Procedure 6-5.5: "Provision Line timing mode with Output Timing" (p. 6-28).

For more information about timing modes and output timing, refer to "Timing modes" (p. 6-16) and "Timing output signals" (p. 6-16).

END OF STEPS

Procedure 6-5.1: Provision Free Running timing mode

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15).

Steps

Complete the following steps to provision the network element Timing Mode to Free Running.

1 From the System View menu, select **Configuration** → **Timing/Sync**.

Result: The *Configure Timing/Sync* window opens.

2 Select the **System Timing** tab.

3 From the **Timing Mode** drop-down menu, select **Free Running**.

4 Click **OK**.

Result: A warning message may appear. Click **Yes** to execute the command.

END OF STEPS

Procedure 6-5.2: Provision External timing mode

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15).

Steps

Complete the following steps to provision the network element Timing Mode to External.

1 From the System View menu, select **Configuration** → **Timing/Sync**.

Result: The *Configure Timing/Sync* window opens.

2 Select the **System Timing** tab.

3 

NOTICE

Service-disruption hazard

Changing the System Synchronization Characteristic parameter of an in-service system may affect system operations. Circuit pack failures and service interruptions may occur.

The System Synchronization Characteristic parameter is generally provisioned when the system is integrated into a network. Do not change the System Synchronization Characteristic parameter unless you are reconfiguring the network and have been directed to do so.

If required, provision the **System Synchronization Characteristic** according to the work instructions.

For more information about the System Synchronization Characteristic, refer to "System synchronization characteristic" (p. 6-15).

4 From the **Timing Mode** drop-down menu, select **External** (initial value).

5 For **Output Timing**, select **Disabled** (initial value).

Result: With the **Timing Mode** set to **External**, and **Output Timing** set to **Disabled**, the synchronization mode is set to External.

6 Provision the **Clock Mode Switching**, **Reference Switching**, **Reference 1 Alarm Severity Assignment Profile** and **Reference 2 Alarm Severity Assignment Profile** parameters according to the work instructions.

For more information about clock mode switching and reference switching, refer to "Clock mode switching" (p. 6-17) and "Reference switching" (p. 6-17).

7 Click on the **Timing Input Ports** tab.

8 **Important!** Synchronization Status Messages on DS1 external references are only supported when the ESF frame format is provisioned. Synchronization Status Messages on E1 external references are only supported when the CRC4 frame format is provisioned.

Provision the required **REF-1**, **REF-2**, and **SSM** (Synchronization Status Messages) parameters for the timing input reference signals according to the work instructions.

9 Click **OK**.

Result: A warning message may appear. Click **Yes** to execute the command.

END OF STEPS

Procedure 6-5.3: Provision Line timing mode

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15).

Steps

Complete the following steps to provision the network element Timing Mode to Line.

1 **Important!** If the Synchronization Autoreconfiguration parameter is to be Enabled, then Sync Messaging *must* be enabled on the associated OC-n port.

If required, select **View** → **Timing/Sync** from the System View menu, then select the **Sync Message Status** tab to determine if sync messaging is enabled or disabled. **SByte** in the **Type** column indicates that sync messaging is enabled.

If required, select **Configuration** → **Equipment** to access the required OC-n port and enable the Sync Messaging parameter.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 From the System View menu, select **Configuration** → **Timing/Sync**.

Result: The *Configure Timing/Sync* window opens.

3 Select the **System Timing** tab.

4 From the **Timing Mode** drop-down menu, select **Line**.

5 For **Output Timing**, select **Disabled** (initial value).

Result: With the **Timing Mode** set to **Line**, and **Output Timing** set to **Disabled**, the synchronization mode is set to Line timing.

6 **Important!** It is recommended that Synchronization Autoreconfiguration be enabled to provide the most reliable network synchronization.

Provision the **Clock Mode Switching**, **Reference Switching**, **Optical Synchronization Source**, and **Synchronization Autoreconfiguration** parameters according to the work instructions.

For more information about clock mode switching and reference switching, refer to "Clock mode switching" (p. 6-17) and "Reference switching" (p. 6-17).

For more information about Synchronization Autoreconfiguration, refer to "Synchronization autoreconfiguration" (p. 6-17).

7 Click **OK**.

Result: A warning message may appear. Click **Yes** to execute the command.

END OF STEPS

Procedure 6-5.4: Provision External timing mode with Output Timing

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15).

Steps

Complete the following steps to provision the network element Timing Mode to External with output timing.

1 **Important!** The **AIS Threshold** parameter for the timing output ports in this procedure will not work unless Sync Messaging is enabled on the associated OC-n ports, although the NE will allow the user to change the parameter value. The **AIS Threshold** setting is the sync status message quality level which will generate AIS on the output ports.

To prevent AIS from being generated on the timing output ports, the sync status message level received from the optical interface synchronization source must be a higher quality than that set for the AIS Threshold.

If required, select **View** → **Timing/Sync** from the System View menu, then select the **Sync Message Status** tab to determine if sync messaging is enabled or disabled. **SByte** in the **Type** column indicates that sync messaging is enabled. If sync messaging is enabled, make a note of the Input Message levels for the associated OC-n ports.

If required, select **Configuration** → **Equipment** to access the required OC-n port and enable the Sync Messaging parameter.

If required, select **View** → **Timing/Sync**, click on the **Sync Message Status** tab, and make a note of the Input Message level for the required OC-n ports.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 From the System View menu, select **Configuration** → **Timing/Sync**.

Result: The *Configure Timing/Sync* window opens.

3 Select the **System Timing** tab.

4 

NOTICE

Service-disruption hazard

Changing the System Synchronization Characteristic parameter of an in-service system may affect system operations. Circuit pack failures and service interruptions may occur.

The System Synchronization Characteristic parameter is generally provisioned when the system is integrated into a network. Do not change the System Synchronization Characteristic parameter unless you are reconfiguring the network and have been directed to do so.

If required, provision the **System Synchronization Characteristic** according to the work instructions.

For more information about the System Synchronization Characteristic, refer to "System synchronization characteristic" (p. 6-15).

5 From the **Timing Mode** drop-down menu, select **External**.

6 For **Output Timing**, select **Enabled**.

With the **Timing Mode** set to **External**, and **Output Timing** set to **Enabled**, the synchronization mode is set to External SyncOut.

7 **Important!** The sync status message level of the selected OC-n line must be higher than the AIS Threshold level setting in Step 11 to prevent AIS from being generated on the output ports.

Provision the **Clock Mode Switching**, **Reference Switching**, **Optical Synchronization Source**, **Reference 1 Alarm Severity Assignment Profile** and **Reference 2 Alarm Severity Assignment Profile** parameters according to the work instructions.

For more information about clock mode switching and reference switching, refer to "Clock mode switching" (p. 6-17) and "Reference switching" (p. 6-17).

8 Click the **Timing Input Ports** tab.

9 **Important!** Synchronization Status Messages on DS1 external references are only supported when the ESF frame format is provisioned. Synchronization Status Messages on E1 external references are only supported when the CRC4 frame format is provisioned.

Provision the required **REF-1**, **REF-2**, and **SSM** (Synchronization Status Messages) parameters for the timing input reference signals according to the work instructions.

10 Select the **Timing Output Ports** tab.

11 **Important!** The AIS Threshold function for the timing output ports will not work unless Sync Messaging is enabled on the associated OC-n port, although the NE will allow the user to change the AIS threshold value.

Provision the required **AIS Threshold** (SONET and SDH), **REF-1**, **REF-2** parameters for the timing output reference signals according to the work instructions.

12 Click **OK**.

Result: A warning message may appear. Click **Yes** to execute the command.

END OF STEPS

Procedure 6-5.5: Provision Line timing mode with Output Timing

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15).

Steps

Complete the following steps to provision the network element Timing Mode to Line with output timing.

1 **Important!** The **AIS Threshold** parameter for the timing output ports in this procedure will not work unless Sync Messaging is enabled on the associated OC-n ports, although the NE will allow the user to change the parameter value. The **AIS Threshold** setting is the sync status message quality level which will generate AIS on the output ports.

To prevent AIS from being generated on the timing output ports, the sync status message level received from the optical interface synchronization source must be a higher quality than that set for the AIS Threshold.

If required, select **View** → **Timing/Sync** from the System View menu, then select the **Sync Message Status** tab to determine if sync messaging is enabled or disabled. **SByte** in the **Type** column indicates that sync messaging is enabled. If sync messaging is enabled, make a note of the Input Message levels for the associated OC-n ports.

If required, select **Configuration** → **Equipment** to access the required OC-n port and enable the Sync Messaging parameter.

If required, select **View** → **Timing/Sync**, click on the **Sync Message Status** tab, and make a note of the Input Message level for the required OC-n ports.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 From the System View menu, select **Configuration** → **Timing/Sync**.

Result: The *Configure Timing/Sync* window opens.

3 Select the **System Timing** tab.

4 

NOTICE

Service-disruption hazard

Changing the System Synchronization Characteristic parameter of an in-service system may affect system operations. Circuit pack failures and service interruptions may occur.

The System Synchronization Characteristic parameter is generally provisioned when the system is integrated into a network. Do not change the System Synchronization Characteristic parameter unless you are reconfiguring the network and have been directed to do so.

If required, provision the **System Synchronization Characteristic** according to the work instructions.

For more information about the System Synchronization Characteristic, refer to "System synchronization characteristic" (p. 6-15).

5 From the **Timing Mode** drop-down menu, select **Line**.

6 For **Output Timing**, select **Enabled**.

With the **Timing Mode** set to **Line**, and **Output Timing** set to **Enabled**, the synchronization mode is set to Line SyncOut.

7 **Important!** The sync status message level of the selected line must be higher than the AIS Threshold level setting in Step 9 to prevent AIS from being generated on the output ports.

It is recommended that Synchronization Autoreconfiguration be enabled to provide the most reliable network synchronization.

Provision the **Clock Mode Switching**, **Reference Switching**, **Optical Synchronization Source**, and **Synchronization Autoreconfiguration** parameters according to the work instructions.

For more information about clock mode switching and reference switching, refer to "Clock mode switching" (p. 6-17) and "Reference switching" (p. 6-17).

For more information about Synchronization Autoreconfiguration, refer to "Synchronization autoreconfiguration" (p. 6-17).

8 Select the **Timing Output Ports** tab.

9 **Important!** The AIS Threshold function for the timing output ports will not work unless Sync Messaging is enabled on the associated OC-n port, although the NE will allow the user to change the AIS threshold value.

Synchronization Status Messages on DS1 external references are only supported when the ESF frame format is provisioned. Synchronization Status Messages on E1 external references are only supported when the CRC4 frame format is provisioned.

Provision the required **AIS Threshold** (SONET and SDH), **REF-1**, **REF-2**, and **SSM** (Synchronization Status Messages) parameters for the timing output reference signals according to the work instructions.

10 Click **OK**.

Result: A warning message may appear. Click **Yes** to execute the command.

END OF STEPS

Procedure 6-6: Provision system alarm configuration

Overview

Use this procedure to provision the following system alarm configuration parameters:

- **Alarm-Clear Delay**
  Sets the time in seconds that the system waits before reporting that an alarm condition is cleared. Alarm-Clear Delay only applies to equipment alarms, not to signal failures. Signal failures have a fixed 10-second delay.
- **Alarm-Generate Delay**
  Sets the time in seconds that the system waits before reporting an incoming signal alarm condition.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision system alarm parameters.

1 From the System View menu, select **Configuration** → **Alarms** → **Alarm Configuration**.

Result: The *Configure Alarms* window opens.

2 Provision the **Alarm-Clear Delay** and/or **Alarm-Generate Delay** parameters according to the work instructions and Click **OK**.

END OF STEPS

Procedure 6-7: Provision new alarm severity assignment profile

Overview

Use this procedure to provision a new alarm severity assignment profile (ASAP).

To change an existing ASAP, refer to Procedure 6-8: "Change existing alarm severity assignment profile" (p. 6-34).

Important! The system supports up to 127 user-created ASAPs. (This does not include DEFAULT ASAPs.) Attempts to create more than 127 user-created ASAPs will be denied. To create another ASAP, delete an existing ASAP and then create the new ASAP. To delete an existing ASAP, refer to Procedure 6-9: "Delete alarm severity assignment profile" (p. 6-37).

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify the required ASAP type, the new ASAP name, and the alarm severity levels to be provisioned.

Steps

Perform the following steps to provision a new alarm severity assignment profile (ASAP).

1 From the System View menu, select **Configuration** → **Alarms** → **Alarm Severity Assignment Profile**.

Result: The *Provision Alarm Severity Profile* window opens.

2 Select the **New ASAP** Operation and the ASAP type to be created from the list. Then click **New ASAP** at the bottom of the window.

Result: The ASAP information appears.

3 Provision the ASAP Name and Alarm Severity Levels according to the work instructions and click **Apply**.

Result: A warning appears asking you to confirm executing this command. Click **Yes**.

4 If required, repeat Step 2 and Step 3 to provision another new ASAP. Otherwise, click **Close**.

5 From the System View menu, select **View** → **View Alarms** → **View Alarm Severity Assignment Profile**.

Result: The *View Alarm Severity Profile* window opens.

6 Select the required new ASAP and click **View ASAP**.

Result: The ASAP details appear.

7 Using the work instructions, verify that the Alarm Severity Levels were provisioned correctly for the new ASAP.

8 If required, repeat Step 6 and Step 7 to view another ASAP. Otherwise, click **Close**.

The ASAP is now ready to be assigned to the appropriate entities. To assign an ASAP to an entity, refer to the appropriate provisioning procedure for the specific entity or Procedure 6-10: “Assign alarm severity assignment profile” (p. 6-39).

The provisioned ASAP and alarm severity levels are retained until the ASAP is changed/deleted or a system reset is performed using **Fault** → **Reset** → **Initialize System**. A system reset removes all user-created ASAPs and changes the alarm severity levels of the DEFAULT ASAPs to the default values.

END OF STEPS

Procedure 6-8: Change existing alarm severity assignment profile

Overview

Use this procedure to perform the following:

- change the name of a user-created alarm severity assignment profile (ASAP). The name of DEFAULT ASAPs is not user-provisionable.
- change the alarm severity levels of an ASAP.
- restore the default alarm severity levels of a DEFAULT ASAP

To provision a new ASAP, refer to Procedure 6-7: “Provision new alarm severity assignment profile” (p. 6-32).

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 6-2) and “Required equipment” (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify the required ASAP and the changes to be provisioned.

Steps

Perform the following steps to change an existing alarm severity assignment profile (ASAP).

1 From the System View menu, select **Configuration** → **Alarms** → **Alarm Severity Assignment Profile**.

Result: The *Provision Alarm Severity Profile* window opens.

2

If...	Then...
changing the name of a user-created ASAP,	Perform the following: 1. Select the **Provision ASAP** Operation and the ASAP to be changed from the list. Then click **Provision** at the bottom of the window. 2. Provision the New Name and/or Alarm Severity Levels according to the work instructions and click **Apply**. A warning appears asking you to confirm executing this command. Click **Yes**.
changing the alarm severity levels of a user-created or DEFAULT ASAP,	
restoring the default alarm severity levels of a DEFAULT ASAP,	Perform the following: 1. Select the **Initialize ASAP** Operation and the DEFAULT ASAP to be initialized from the list. Then click **Initialize** at the bottom of the window. 2. Verify the DEFAULT ASAP information and click **Apply**. A warning appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 2 to change another ASAP. Otherwise, click **Close**.

4 From the System View menu, select **View** → **View Alarms** → **View Alarm Severity Assignment Profile**.

Result: The *View Alarm Severity Profile* window opens.

5 Select the changed ASAP and click **View ASAP**.

Result: The ASAP details appear.

6 Using the work instructions, verify that the ASAP Name and/or Alarm Severity Levels were provisioned correctly for the ASAP.

7 If required, repeat Step 5 and Step 6 to view another ASAP. Otherwise, click **Close**.

If the ASAP is active, then the changes are applied to the next alarm reported for the entity that the ASAP is assigned to.

END OF STEPS

Procedure 6-9: Delete alarm severity assignment profile

Overview

Use this procedure to delete a user-created alarm severity assignment profile (ASAP) that is not currently active. DEFAULT ASAPs *cannot* be deleted.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify the user-created ASAP to be deleted.

Steps

Perform the following steps to delete a user-created alarm severity assignment profile (ASAP) that is not currently active.

1 **Important!** The system will *not* delete an ASAP that is assigned to an entity.

From the System View menu, select **Reports → Alarm Severity Assignment Profile User List**.

Result: The *View Alarm Severity Profile User List* window opens.

2 Select the required ASAP to be deleted and click **ASAP User List**.

Result: The ASAP user list appears.

3 Using the ASAP user list, determine if the ASAP to be deleted is currently assigned to an entity (active). Record any entities that are listed.

4 If required, repeat Step 2 and Step 3 to view the user list for another ASAP. Otherwise, click **Close**.

5 If the ASAP to be deleted is currently assigned to an entity, assign another ASAP to the entity.

Reference: Procedure 6-10: "Assign alarm severity assignment profile" (p. 6-39)

6 Select **Configuration** → **Alarms** → **Alarm Severity Assignment Profile**.

Result: The *Provision Alarm Severity Profile* window opens.

7 Select the **Delete ASAP** Operation and the ASAP to be deleted from the list. Then click **Delete** at the bottom of the window.

Result: The ASAP information appears.

8 Verify the ASAP information and click **Apply**.

Result: A warning appears asking you to confirm executing this command. Click **Yes**.

9 If required, repeat Step 7 and Step 8 to delete another ASAP. Otherwise, click **Close**.

10 Select **View** → **View Alarms** → **View Alarm Severity Assignment Profile** and verify that the ASAP was deleted.

END OF STEPS

Procedure 6-10: Assign alarm severity assignment profile

Overview

Use this procedure to assign a DEFAULT or user-created alarm severity assignment profile (ASAP) to an entity within the system (for example, system, circuit pack, or port).

ASAPs cannot be preassigned to an entity before the entity is created in the system.

When an entity is created in the system (for example, a slot is equipped with a circuit pack), the system assigns the associated DEFAULT ASAP to the entity.

Different ASAPs within an ASAP type may be assigned to different entities within the system; however, only one ASAP may be assigned to an entity at a time. Assigning a different ASAP to an entity will override the previous assignment. The specified ASAP must agree with the allowed ASAP type for that entity in order to be assigned to the entity.

To create a new ASAP, refer to Procedure 6-7: “Provision new alarm severity assignment profile” (p. 6-32).

To change an existing ASAP, refer to Procedure 6-8: “Change existing alarm severity assignment profile” (p. 6-34).

ASAP types

The system supports the following ASAP types:

- 1+1 Bidirectional Protection Group
- 1+1 Optimized Protection Group
- BLSR Protection Group
- Data Port
- DS1 Port
- DS3 Port
- E1 Port
- EC1 Port
- Circuit Pack
- Fast Ethernet Port
- Gigabit Ethernet Port
- Link Aggregation Group
- Non-Volatile Memory Module
- OCH Port
- OCn Port
- ODU2 Tributary

- OTS Port
- OTU2 Port
- Pluggable Transmission Module
- STS Ring Channel
- Subshelf
- System
- System Timing
- VC12 Ring Channel
- VCG Port
- VCG STS Tributary
- VCG VT1.5 Tributary
- VT1.5 Ring Channel

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify the entity (for example, system, circuit pack or port) and the ASAP to be assigned.

Steps

Perform the following steps to assign a DEFAULT or user-created alarm severity assignment profile (ASAP) to an entity within the system (for example, system, circuit pack, or port).

1 From the System View menu, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Select the required entity according to the work instructions and click **Select**.

Result: The provisionable parameters appear.

3 If required, click **View Details** to view the DEFAULT ASAP and the user-created ASAPs (if provisioned) for the associated ASAP type. Click **Close**.

4 Select the required ASAP according to the work instructions and click **Apply**.

Result: A warning may appear asking you to confirm executing this command. Click **Yes**. Click **Close** to exit.

5 From the System View menu, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

6 Select the required entity according to the work instructions and click **Select**.

Result: The entity details appear.

7 Using the work instructions, verify that the correct ASAP was assigned to the entity. Click **Close** to exit.

END OF STEPS

Procedure 6-11: Evaluate bandwidth utilization

Overview

Use this procedure to view backplane and VT fabric utilization and evaluate whether to manually optimize backplane bandwidth between the main packs and specified LS group(s).

For more information on the impact of optimization, seeProcedure 6-12: “Optimize backplane bandwidth” (p. 6-44).

Important! Optimization will only change the internal cross-connection routing; it will not change the endpoints of any cross-connections.

Excessive fragmentation warnings

You can determine if excessive fragmentation exists in the following ways:

- If you provision a new cross-connection and the backplane bandwidth necessary to support the cross-connection is not available, the command will be denied with a SARB (Status All Resources Busy) error response.
- You can check the backplane utilization for each transmission pack and the VT fabric utilization for the main pack in the shelf. You can use the CIT to display the information or view the raw utilization data in the output of the RTRV-ST-EQPT command.

Privilege level

You must login as a Privileged or General user to complete this procedure.

Before you begin

Refer to “Before you begin” (p. 6-2) and “Required equipment” (p. 6-2) in this chapter.

Steps

Important! For Ethernet packs that support VT cross-connections, only the backplane utilization parameters are reported; VT utilization is not reported on the LNW74 pack.

Use the following procedure to evaluate whether you need to optimize backplane bandwidth.

1 Login to the shelf you want to evaluate.

2 Choose from the following reports that may help you evaluate the current bandwidth usage on your shelf or system.

If you want to...	Then choose this report..	Using this Invocation...
View backplane utilization for all function packs on the system. Use to determine when manual defragmentation is necessary.	View backplane bandwidth utilization	**Reports → Backplane Bandwidth Utilization**
View STS fabric utilization and VT fabric utilization (when available) on a per slot or shelf basis	View backplane bandwidth utilization	**View → Backplane Bandwidth Utilization**
View XC fabric utilization for main and function packs to see when you are reaching the limits of capacity and need to plan for more shelves.	XC fabric utilization	**Reports → VT XC Fabric Utilization**

3 View the information presented. For more information on the details provided in these reports, click the help button in the reports screen.

4 If you decide to perform the backplane bandwidth optimization operation, see Procedure 6-12: “Optimize backplane bandwidth” (p. 6-44) for details about this operation.

END OF STEPS

Procedure 6-12: Optimize backplane bandwidth

Overview

Use this procedure to manually optimize the backplane bandwidth between the main packs and the specified LS group(s).

To determine if you need to optimize bandwidth for a particular circuit pack, see Procedure 6-11: “Evaluate bandwidth utilization” (p. 6-42)

Defragmentation behaviors

Important! For Ethernet packs that support VT cross-connections, only the backplane utilization parameters are reported; VT utilization is not reported on the LNW74 pack.

The following behaviors apply when you perform the defragmentation operation:

- Rearrangements do not interrupt traffic on cross-connections that are not being rearranged.
- No misconnections are caused by rearrangement.
- For the LNW70/LNW170 in STS1 mode, rearrangements are not necessary since higher rate cross-connections are not supported.
- For the LNW74, the VT vs. STS backplane partitioning is preserved during defragmentation of the backplane bandwidth. When enabled, the first 12 backplane STS1s are reserved for VT-cross connections only. The remaining 36 STS1s are reserved for STS cross-connections only. VT cross-connections are rearranged only within the first 12 STS1s and STS cross-connections will be arranged only within the last 36 STS1s.
- Backplane optimization will only affect packs on which the backplane bandwidth is dynamically assigned. During cross-connection provisioning, the NE dynamically assigns the I/O tributaries to the backplane tributaries on the following circuit packs:
  - LNW45 and LNW49 that support the VT grooming on the tributary fabrics when the Mains are equipped with non-VLF Mains. If the Mains are equipped with VLF Mains, the LNW45 and LNW49 circuit packs do not support backplane optimization.
  - LNW63, LNW70/LNW170, LNW73/LNW73C, LNW74, LNW78, and LNW87 where the number of VCG tributaries exceeds the available backplane bandwidth.
- The optimize backplane bandwidth operation removes the fragmentation at the STS1, STS3c and STS12c levels and minimizes the number of STS1s required to transport cross-connected VTs to the main packs. Interruptions will vary from 1 second (OCn) to 3 seconds (Ethernet) in duration on VT1, STS1 and STS3c cross-connections each time they are rearranged.

Excessive fragmentation

You can determine if excessive fragmentation exists in the following ways:

- When you provision a new cross-connection and the backplane bandwidth necessary to support the cross-connection is not available, the command will be denied with a SARB (Status All Resources Busy) error response.
- You can check the backplane utilization for each transmission pack and the VT fabric utilization for the main pack in the shelf. You can use the CIT to display the information or by view the raw utilization data in the output of the RTRV-ST-EQPT command.

Privilege level

You must login as a Privileged or General user to complete this procedure.

Before you begin

Refer to "Before you begin" (p. 6-2) and "Required equipment" (p. 6-2) in this chapter.

Steps



NOTICE

Service-disruption hazard

The following conditions apply to traffic interruptions on a rearranged cross-connection:

- *Protection switching requests may be suspended for up to 25 seconds during rearrangement.*
- *Traffic interruptions due to rearrangement will vary from 1 second (OCn) to 3 seconds (Ethernet with LCAS disabled). A given cross-connection is not be rearranged more than once in response to a single optimization.*
- *Rearrangement of traffic to or from an individual function group completes within 85 seconds. Rearrangement of all function groups completes within 200 seconds.*
- *When LCAS is enabled on an Ethernet pack, the duration of the traffic interruption increases to a maximum of 30 seconds.*

Disable LCAS prior to performing a rearrangement operation on an Ethernet/Data interface.

Complete the following steps to optimize backplane bandwidth.

1 From the System View menu, select **Configuration** → **Optimize Backplane Bandwidth**.

Result: The **Equipment Selection** screen opens.

The Equipment Selection screen will not open under the following conditions:

- If there are any existing test access sessions in the NE, you will see the following error message: “Optimize Backplane Bandwidth is not allowed when there are test access sessions existing in the NE.”
- If the NE is in Ring Upgrade mode, you will see the following error message: “Optimize Backplane Bandwidth is not allowed when the NE is in Ring Upgrade mode.”

2 From the **Equipment Selection** screen, highlight the required functional pack or the shelf.

Only the system and function slots equipped with LNW45 (when the Mains are equipped with non-VLF Mains), LNW49 (when the Mains are equipped with non-VLF Mains), LNW63, LNW70/LNW170, LNW73C/LNW73C, LNW74, LNW78, or LNW87 circuit packs will be displayed in the equipment selection screen.

3 Click **Select**.

Important! Defragmentation will not be initiated if one of the following conditions exist:

- If any test access sessions exist on the NE.
- If the system is in ring upgrade mode.

4 **Important!** Optimizing backplane bandwidth for the System (All) may take up to four minutes, and protection switching may be disabled for up to 25 seconds during optimization.

A confirmation window opens warning you that execution of this command may affect NE service. Choose one of the following:

- **Yes**- to initiate optimization.
- **No** - to close the message box, then click **Close** to return to the NE view.

Result: A confirmation message will appear in the Most Recent Command status bar of the CIT System View.

END OF STEPS

Procedure 6-13: Provision J0 section trace

Overview

Use this procedure to provision J0 section trace for an OC-n or EC-1 line.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

J0 section trace

The J0 byte in the OC-n and EC-1 section overhead provides the ability to repeatedly transmit and receive a provisioned message so that the receiver can verify continued connectivity to the intended transmitter. The actual receive message is compared to the provisioned expected receive message. If a mismatch is detected, the system reports an alarm/condition.

J0 section trace allows users to perform the following:

- Select formats for the transmit and expected receive J0 byte
- Provision transmit and expected receive section trace messages
- Enable or disable monitoring/reporting of the received J0 section trace
- Enable or disable consequent actions in response to detecting a J0 section trace mismatch

Section trace formats and messages

The following section trace formats and messages are supported:

- *Format 1*: A provisionable 1-Byte ASCII or Hexadecimal message for OC-n and EC-1 interfaces
- *Format 2* (initial value): A fixed (not provisionable) 1-Byte Hexadecimal message (01) for OC-n and EC-1 interfaces
- *Format 16*: A provisionable 16-Byte ASCII or Hexadecimal message for OC-n interfaces only
- *Format 64*: A provisionable 64-Byte ASCII or Hexadecimal message for OC-n interfaces only

When *Format 2* is the expected receive section trace format, J0 section trace monitoring is disabled.

The hexadecimal values may consist of characters 0–9 and A–F. The provisioned values may consist of up to twice the number specified by the format (since there are two digits per byte). If fewer characters than the maximum are specified, the value is padded with 0.

The ASCII values may consist of any character except the semicolon (;), double quote (“), and backslash (\). For 1-Byte formats, a single character is allowed. For the 16-Byte format, up to 15 characters are allowed. For the 64-Byte format, up to 63 characters are allowed. For the 16-Byte and 64-Byte formats, the system prepends a valid CRC-7 byte.

J0 section trace monitoring

The network element allows users to provision whether or not to monitor the actual receive section trace format and message for defects.

When the Receive Section Trace Identifier Monitor parameter is enabled, the network element compares the actual receive section trace format/message with the provisioned expected receive section trace format/message. If a mismatch is detected, the system reports a Section Trace Identifier Mismatch alarm/condition.

When the Receive Section Trace Identifier Monitor parameter is disabled, the network element does *not* compare the actual receive section trace format/message with the provisioned expected receive section trace format/message.

J0 section trace monitoring does *not* affect the Transmit Section Trace parameters.

Consequent actions

The detection of J0 section trace mismatches may be provisioned to trigger consequent actions similar to other alarms, or it may be provisioned for use as a diagnostic tool only.

If the Receive Section Trace Identifier Mismatch Consequent Action parameter is enabled and a mismatch is detected, AIS-L is transmitted downstream and Line/Path switching is performed. The system also reports an
`inc. OCN section trace identifier mismatch` (TIM-S) or
`inc. EC1 section trace identifier mismatch` (TIM-S) alarm/condition in response to the mismatch.

If the Receive Section Trace Identifier Mismatch Consequent Action parameter is disabled and a mismatch is detected, AIS-L is not sent downstream and Line/Path switching is not performed. The system also reports an
`inc. OCN section trace identifier mismatch, diagnostic` (TIM-S-D) or
`inc. EC1 section trace identifier mismatch, diagnostic` (TIM-S-D) alarm/condition in response to the mismatch.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 6-2) and “Required equipment” (p. 6-2) in this chapter.
2. Obtain the work instructions for this procedure.

3. Verify that the work instructions identify the network elements and OC-n/EC-1 ports to be provisioned.
4. Verify that the work instructions specify the required J0 section trace parameters and values to be provisioned.

Steps

Perform the following steps to provision J0 section trace for an OC-n or EC-1 line.

1 **Important!** J0 section trace is provisioned for one direction of transmission at a time.

Using the work instructions, determine whether J0 section trace is to be provisioned for both directions of transmission. If J0 section trace is to be provisioned for both directions of transmission, identify the direction of transmission to be provisioned first.

2 Identify and log in to the required network elements.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 At the head-end (transmit) network element, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

4 Find the circuit pack with the port being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack.

5 Click (highlight) the port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear.

6 Click the *J0 Section Trace* tab.

Result: The port J0 section trace parameters appear.

7 Provision the *Transmit Section Trace Format*, *Transmit Section Trace Display Mode*, and *Transmit Section Trace Value* parameters according to the work instructions and click **Apply**. Click **Close**.

For more information about the J0 section trace formats and messages refer to "Section trace formats and messages" (p. 6-47).

8 At the tail-end (receive) network element, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

9 Find the circuit pack with the port being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack.

10 Click (highlight) the port being provisioned, then click **Select** at the bottom of the window.

Result: The port parameters appear.

11 Click the *J0 Section Trace* tab.

Result: The port J0 section trace parameters appear.

12 Provision the *Expected Receive Section Trace Format*, *Expected Receive Section Trace Display Mode*, and *Expected Receive Section Trace Value* parameters according to the work instructions.

For more information about the J0 section trace formats and messages refer to "Section trace formats and messages" (p. 6-47).

13 Enable/Disable the *Receive Section Trace Identifier Monitor* and *Receive Section Trace Identifier Mismatch Consequent Action* according to the work instructions and click **Apply**. Click **Close**.

For more information about the J0 section trace monitoring and consequent actions, refer to "J0 section trace monitoring" (p. 6-48) and "Consequent actions" (p. 6-48).

14 At the tail-end (receive) network element, click the **Alarm List** button to verify that no J0 section trace alarms/conditions are present for the provisioned OC-n or EC-1 port.

If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear any alarms/conditions.

15 If required, repeat Step 3 through Step 14 to provision J0 section trace for the opposite direction of transmission.

END OF STEPS

7 System administration procedures

Overview

Purpose

Use the procedures in this chapter as reference for provisioning optional system administration parameters from the System View **Administration** menu.

This chapter includes procedures used to:

- Change your own password (Change Password)
- Provision User and Network Element Security
- Provision Data Communications
- Set TL1 Message Map
- Change NE Login Banner
- Set Date and Time
- Set TID (system name)
- Set NE defaults (FTP, AGNE, remote NE status)
- Provision Network Time Protocol
- Provision SNMPV1-2 and SNMPV3
- Provision RADIUS server
- Provision Access Control

Depending on local procedures, types of configurations, and shelf equipage, some of the optional parameters may need to be set. It is assumed that local system administration is responsible for determining these parameter settings. Some of the parameter values may be set during the initial shelf turn-up. Other parameter values may be set after the system is integrated into the network configuration.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedures, that additional equipment is listed in that procedure.

Procedure 7-1: Provision system administration parameters

Overview

Use this procedure as reference for provisioning optional system administration parameters from the System View **Administration** menu.

Administration parameters allow you to:

- Change your own password (Change Password)
- Provision User and Network Element Security
- Provision Data Communications
- Set TL1 Message Map
- Change NE Login Banner
- Set Date and Time
- Set TID (system name)
- Set NE defaults (FTP, AGNE, remote NE status)
- Provision Network Time Protocol.

Depending on local procedures, types of configurations, and shelf equipage, some of the optional parameters may need to be set. It is assumed that local system administration is responsible for determining these parameter settings.

Some of the parameter values may be set during the initial shelf turn-up. Other parameter values may be set after the system is integrated into the network configuration.

Steps

Use the sections in this procedure as reference for setting system administration parameters.

1 Reference the sections in this procedure to provision the required Administration parameters from your work instructions.

Important! Some of the parameters may have already been provisioned from earlier procedures.

END OF STEPS

Change Password

This command allows any user to change his/her own password.

Administration → Change Password

Procedure 7-2: “Change your own password” (p. 7-10)

Security

This command allows privileged users and in some cases also administration users to perform the following:

- User Security Provisioning
  Administration → Security → Provision User Logins
  Procedure 7-3: “Edit, delete, or enter a user's login” (p. 7-11)
  Creates or modifies another user's security data (for example, user IDs and passwords).
- Enable/Disable Lockout Security State (privileged users only)
  Administration → Security → Enable Lockout Security State
  Administration → Security → Disable Lockout Security State
  Procedure 7-4: “Enable/disable lockout security state” (p. 7-15)
  Enables or locks out non-privileged user ID access to the NE.
- Enable/Disable User IDs
  Administration → Security → Enable User Login
  Administration → Security → Disable User Login
  Procedure 7-20: “Enable/disable user ID(s)” (p. 7-56)
  Enables/disables one or all non-default user logins.
- Log Out Other Network Element Users
  Administration → Security → Logout NE User
  Procedure 7-22: “Log out user(s)” (p. 7-60)
  Terminates the login session of the user executing this command in addition to either one user, or all non-privileged, or all non-administration users. Privileged or administration users must be terminated one user at a time.
- Network Element Security Provisioning
  Administration → Security → Provision NE Security
  Procedure 7-21: “Provision network element security” (p. 7-58)
  Provisions network element level security parameters (for example, User ID Lockout Threshold).
- SNMP V1-2 and V3 User Provisioning (privileged users only)
  Administration → Security → Provision SNMP V1-2 Users
  Administration → Security → Provision SNMP V3 Users
  Procedure 7-6: “Edit, delete, or enter SNMP V1-2 users” (p. 7-19)
  Procedure 7-25: “Edit, delete, or enter SNMP V3 users” (p. 7-66)
  Related SNMP provisioning may require LAN port provisioning, IP Routing, TCP/IP access.
- Remote Authentication Dial In User Service (RADIUS) Provisioning
  Administration → Security → Provision RADIUS Server
  Procedure 7-24: “Provision RADIUS server” (p. 7-63)

Provisions RADIUS server information (for example, IP address).

- SNMP V3 Table Provisioning (privileged users only)
  Administration → Security → Provision SNMP Tables
  Procedure 7-26: "Provision SNMP V3 tables" (p. 7-69)
- Access Control List Provisioning
  Administration → Security → Provision Access Control
  Procedure 7-27: "Provision access control" (p. 7-71)
  Creates or deletes entries on the Access Control List.

Allow/Inhibit Autonomous Message Reporting

This command allows any user to enable or disable autonomous messages for their login session.

Administration → Allow/Inhibit Autonomous Message Reporting → Current Session

Procedure 7-7: "Allow/inhibit autonomous message reporting" (p. 7-23)

Allows/Inhibits reporting of autonomous alarm and status messages on a user basis per login session. Select Enabled or Disabled as required.

Allow/Inhibit Port/Tributary Maintenance

The following commands allow a privileged user to change the maintenance state of existing ports and tributaries.

Administration → Allow/Inhibit Port Maintenance

Administration → Allow/Inhibit Tributary Maintenance

Procedure 7-23: "Allow/inhibit port/tributary maintenance" (p. 7-61)

Change NE Login Banner

This command allows a privileged user to add a user-defined proprietary notice at login to enhance system security.

Administration → Change NE Login Banner

Procedure 7-8: "Create or edit login banner" (p. 7-25)

Set NE

This command allows a privileged user to provision the NE defaults for the following:

- Enable/Disable remote NE status
- Enable/Disable the NE as an Alarm Gateway Network Element (AGNE) and assign alarm group numbers
- Enable/Disable File Transfer Protocol (FTP)

- Enable/Disable FTAM-FTP Gateway
- Provision the security and history log warning threshold.

Administration → Set NE

Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

Set Date and Time

This command allows a privileged user to manually set the Date and Time for this NE.

Administration → Set Date and Time

Procedure 7-10: "Set date and time" (p. 7-31)

Note that this command is used to manually set the Date and Time for the NE. If you are using Network Time Protocol, refer to **Administration → Set Network Time Protocol**

Procedure 7-10: "Set date and time" (p. 7-31)

Set TID

This command allows a privileged user to set the Target Identifier (TID) for this NE. The more common time to change a TID is prior to placing the system in-service. However, this procedure can also be used to change the TID of an in-service system.

Administration → Set TID

Procedure 7-11: "Set/change system TID" (p. 7-36)

The TID is a character string from 1 to 20 characters and must be unique for each NE in the network.

Data Communications

This command allows a privileged user to provision data communications functions.

Administration → Data Communications

Selecting one of the following tabs allows a privileged user to provision Data Communications parameters:

- **IP Routing**

  Use this procedure to provision IP Routing functionality to utilize DCC Channels for IP communications.

  Procedure 9-10: "Add IP route(s) through network" (p. 9-118)

  Use this procedure to provision static IP routes over DCC links.

  Procedure 7-17: "Provision static IP routes on DCC links" (p. 7-49)
- **TCP/IP Gateway**

Use this procedure to enable or disable the Alcatel-Lucent 1665 DMX as a TL1 TCP/IP GNE and provision authorized IP calling OS host addresses.

Note that TCP/IP functionality must also be enabled and the required TCP/IP parameters provisioned for at least one of the NE's IAO LAN ports.

Procedure 7-16: “Provision/enable/disable the NE as a TL1 TCP/IP GNE” (p. 7-46)

- **Serial Port**

  Use this procedure to provision the selected CIT-1 and/or CIT-2 serial port parameters. The user of a serial port may adjust the echo and baudrate parameters of the port. Only a privileged user may modify the parameters without using the serial port.

  Procedure 7-18: “Provision RS232 CIT (CIT-1) and/or MODEM (CIT-2) serial port parameters” (p. 7-51)

- **SNMP Management**

  Use this procedure to provision system SNMP management features.

  Related SNMP provisioning may require LAN port provisioning, IP Routing, and TCP/IP access.

  Procedure 7-5: “Provision system SNMP management features” (p. 7-16)

- **OSI LAN Management**

  Use this procedure to enable or disable the OSI-LAN port status for LAN ports lan-1 and/or lan-2.

  Procedure 7-12: “Enable/disable OSI on an IAO LAN port” (p. 7-38)

- **Network Layer**

  Use this procedure to modify the NSAP address and provision the node as a Level 1 or Level 1&2 router.

  Values should not be changed from default values except by users who intend to provision the SONET subnetwork and partition DCC communications.

  Procedure 7-13: “Provision network layer 3 parameters” (p. 7-39)

- **NSAP Threshold Alarming**

  Use this procedure to provision the NSAP count threshold level for monitoring the number of NSAPs in the level 1 area.

  Procedure 7-13: “Provision network layer 3 parameters” (p. 7-39)

- **TARP**, **TARP Data Cache**, and **TARP Manual Adj.**

  Use this procedure to provision user settable fields and functions relating to TARP Propagation and Origination parameters, TARP Data Cache entries, and TARP Manual Adjacencies.

  Procedure 7-14: “Set TARP parameters” (p. 7-41)

- **TCP/IP**

  Use this procedure to provision, enable, or disable TCP/IP on an IAO LAN Port. This is also used to enable or disable proxy Address Resolution Protocol (ARP) on an IAO LAN port.

  Procedure 7-15: “Provision TCP/IP and Proxy ARP on an IAO LAN port” (p. 7-43)

- **SCN**

Use this to enable or disable IP communications over an optical line DCC and/or a LAN. This is also used to provision the related LAN IP address and LAN IP subnet mask for the Signaling Communications Network (SCN).

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Set TL1 Message Map

This command allows you to map TL1 autonomous message types to an OS type application context ID (ACID). TL1 autonomous messages are not reported unless they are assigned to an OS type. This command allows a user to assign specific TL1 autonomous message types, or none at all.

Administration → Set TL1 Message Map

Procedure 7-19: "Map TL1 message types to OS applications" (p. 7-54)

Set Network Time Protocol

This command allows you to provision the Network Time Protocol (NTP) Server properties for this NE.

Administration → Set Network Time Protocol

If Network Time Protocol is not used, the following command allows a privileged user to manually provision the network element Date and Time.

Administration → Set Date and Time

Procedure 7-10: "Set date and time" (p. 7-31)

If you are using NTP, it is assumed that either IP Routing has already been established or each node has its own IP address.

Procedure 7-2: Change your own password

Overview

Use this procedure to change your *own* network element password.

Privilege level

You may login as a either a Privileged, Administration, General, Maintenance, or Reports Only user to complete this procedure.

Important! Only users with a privileged or administration access code may change other user's passwords. See Procedure 7-3: “Edit, delete, or enter a user's login” (p. 7-11).

Password guidelines

Refer to “Password guidelines” (p. 7-11).

Before you begin

Prior to performing this procedure, refer to “Before you begin” (p. 7-3) and “Required equipment” (p. 7-3) in this chapter.

Steps

Complete the following steps to change your own network element password.

1 From the System View menu, select **Administration** → **Change Password** to change your own password on an individual NE basis.

Result: The *Change Password* window opens.

2 Enter your old password, enter your new password, and then re-enter your new password for confirmation. Click **OK**.

END OF STEPS

Procedure 7-3: Edit, delete, or enter a user's login

Overview

Use this procedure to:

- Edit an existing user's network element login parameters
- Delete an existing user's network element login parameters
- Enter a new user's network element login parameters.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

User ID guidelines

A valid user ID must be a minimum of five allowed characters to a maximum of ten allowed characters.

Password guidelines

A valid password must comply with the following conditions:

- The maximum and minimum password shall be are provisioned by the Security Administrator.
  - The minimum password length is provisionable to be between 6 (default) and 18 characters.
  - Passwords must contain at least one alphabetic character and at least three non-alphabetic characters (numbers and symbols).
  - The provisioned maximum password length shall be equal to or greater than the minimum password length.
- If the provisioned value of the maximum password length is 10 characters, the following password composition rules apply:
  - A password must contain at least one alphabetic character and at least three non-alphabetic characters (numeric and the special characters)
  - At least one of the non-alphabetic characters must be a numeric character and at least one must be one of the special characters.
- If the provisioned value of the maximum password length is between 11 and 20 characters, the following password composition rules apply:
  - A password must contain a mix of upper-case alphabetic characters, lower-case alphabetic characters, numeric characters, and special characters, including at least two of each type.
  - The password cannot contain the consecutive identical characters.
  - The password cannot contain the user login.

- When passwords are changed, the old and new passwords must be different in at least three-character positions. The original password, or a significant substring of it, must not be part of the new password.

  If the current and new passwords are the same length, then the characters in at least three-character positions must be different.

  If the current and new passwords are different lengths, then for each possible contiguous sub-string of the length of the shorter password within the longer password, the characters in at least three-character positions must be different between the shorter password and the character sub-string within the longer password.
- The network element does not allow reuse of the five most recently used passwords.

  Important! User passwords are case-sensitive.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.

Steps

Complete the following steps to edit, delete, or enter a user's login parameters. For additional information about provisionable entries required in this procedure, refer to Appendix A, "Provisionable parameters".

1

If...	Then...
Entering a new user's login,	Continue with Step 2.
Editing an existing user's login,	Proceed to Step 3.
Delete an existing user's login,	Proceed to Step 4.

2 **Important!** Refer to "User ID guidelines" (p. 7-11) and "Password guidelines" (p. 7-11).

ENTER A NEW USER LOGIN:

1. From the System View menu select **Administration** → **Security** → **Provision User Logins**.
2. From the **User ID Panel**, select **New User** and enter a new user ID in the adjacent field.
3. From the **User Type** panel, select a Security Level for the new user from the pull-down menu.
4. From the **User Password** panel, enter a password for the new user in the **Enter Password:** and Confirm Password: fields.

5. From the **Password Aging Period** panel, select Disable to disable the password aging function, or enter the number of days (from **7**-**999**) before the new user has to change his/her password.
6. From the **Inactivity Timeout Interval** panel, select Disable to disable the timeout function, or enter the number of minutes (from **1**-**999**) before the new user session is logged off because of inactivity.
7. From the **Login ID Status** panel, select Enable or Disable to enable/disable the user ID.
8. From the buttons at the bottom of the screen, click **Add**.
9. Proceed to Step 5.

3 **Important!** Refer to "User ID guidelines" (p. 7-11) and "Password guidelines" (p. 7-11).

EDIT EXISTING USER LOGIN:

1. From the System View, menu select **Administration** → **Security** → **Provision User Logins**.
2. From the **User ID Panel**, select **Existing User** and an existing user ID from the pull-down menu.
   The remaining items in this step may be completed as required. Items not changed will retain existing settings.
3. From the **User Type** panel, select a Security Level for the user from the pull-down menu.
4. From the **User Password** panel, enter a password for the user in the **Enter Password** and Confirm Password fields.
5. From the **New User ID** panel, enter the new ID for the existing user in the **Enter New User ID** field.
6. From the **Password Aging Interval** panel, select Disable to disable the password aging function, or enter the number of days (from **7**-**999**) before the user has to change his/her password.
7. From the **Inactivity Timeout Period** panel, select Disable to disable the timeout function, or enter the number of minutes (from **1**-**999**) before the user session is logged off because of inactivity.
8. From the **Login ID Status** panel, select Enable or Disable to enable/disable the user ID.
9. From the **Lockout Status** panel, select ENABLE_LOGIN to enable a user ID that has been locked out.
10. From the buttons at the bottom of the screen, click **Modify**.
11. Proceed to Step 5.

4 **Important!** Default privileged users cannot be deleted. Non-default Privileged users may be deleted.

DELETE A USER LOGIN:

1. From the System View, menu select **Administration** → **Security** → **Provision User Logins**.
2. From the **User ID Panel**, select **Existing User** and an existing user ID from the pull-down menu.
3. From the buttons at the bottom of the screen, click **Delete**.
4. Proceed to Step 5.

5 Do you want to continue provisioning?

If...	Then...
Yes,	Return to Step 1.
No,	STOP! End of Procedure.

END OF STEPS

Procedure 7-4: Enable/disable lockout security state

Overview

Use this procedure to:

- Enable all *non-privileged* user IDs to access to a network element
- Lockout all *non-privileged* user IDs from the network element.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.

Steps

Complete the following steps to enable or disable the lockout security state.

1

If...	Then...
Enabling all non-privileged user IDs to access the network element,	From the System View menu, select **Administration** → **Security** → **Disable Lockout Security State**. A dialog box appears asking you to confirm executing this command. Click **Yes**.
Locking out all non-privileged user IDs from the network element,	From the System View menu, select **Administration** → **Security** → **Enable Lockout Security State**. A dialog box appears asking you to confirm executing this command. Click **Yes**.

2 From the System View menu, select **Administration** → **Data Communications**.

- From the **Serial Port** tab, verify the **Access State** information for the CIT Port (**In Service** or **Lockout**).
- From the **OSI LAN Management** tab, verify the **Access State** information for the LAN Port (**In Service** or **Lockout**).

END OF STEPS

Procedure 7-5: Provision system SNMP management features

Overview

Use this procedure to:

- Provision SNMP contact and location information
- Enable or disable SNMP authentication failure traps.

To provision SNMP access to the network element from an SNMP manager, refer to Procedure 7-6: "Edit, delete, or enter SNMP V1-2 users" (p. 7-19).

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. If you want to view, print, or save a file of current SNMP users, select **Administration** → **Security** → **View SNMP Users** from the System View menu.

Steps

Perform the following steps to provision the SNMP management feature.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

2 Click on the **SNMP Management** tab to view parameters.

3 Enter the following parameters according to the work instructions and click **Apply**:

- NE Contact

  Contact Name:: an alphanumeric string of up to 255 characters consisting of the name of the contact person for this NE and how to contact the person.
- NE Location

  Location Name: an alphanumeric string of up to 255 characters describing the physical location of this NE.
- SNMP Authentication Failure Trap

SNMP Trap Control: Select Enable or Disable.

Traps are the SNMP equivalent of SONET alarm and event autonomous messages.

Enabling this feature results in the network element sending an Authentication Failure trap to all registered SNMP users if an SNMP request is received from an unauthorized user. An unauthorized user is a user whose IP address/ID pair do not match an entry in the NE's SNMP User list. To add a user to the SNMP User list, refer to Procedure 7-6: "Edit, delete, or enter SNMP V1-2 users" (p. 7-19).

Disabling this feature prevents traps from being sent if there is an authentication failure.

Result: A dialog box may appear asking you to confirm executing this command.

4 Click **Yes**.

Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

Continue with Step 5.

5 Do you wish to perform SNMP User provisioning?

If...	Then...
Yes	Click **No** on the warning window. Then click **Close** and refer to Procedure 7-6: "Edit, delete, or enter SNMP V1-2 users" (p. 7-19). If you select to *NOT* reset in this procedure, you must perform a Phase 3 reset (**Fault** → **Reset** → **System Controller**) before your changes take place.
No	Continue with Step 6.

6 Click **Yes** in the warning window to complete SNMP provisioning.

Result: The following warning message appears *The network element is resetting due to System Reset*.

7 Click **OK**.

Result: The System View closes, the network element resets, and all active users are disconnected.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

8 If you want to view, print, or save a file of current SNMP users, then log back into the network element and select **Administration** → **Security** → **View SNMP Users** from the System View menu.

END OF STEPS

Procedure 7-6: Edit, delete, or enter SNMP V1-2 users

Overview

Use this procedure to provision SNMP V1-2 management access to the system.

To provision SNMP V3 management access to the system, refer to Procedure 7-25: "Edit, delete, or enter SNMP V3 users" (p. 7-66).

To provision SNMP V3 tables, refer to Procedure 7-26: "Provision SNMP V3 tables" (p. 7-69).

To provision SNMP contact/location information and enable/disable SNMP authentication failure traps, refer to Procedure 7-5: "Provision system SNMP management features" (p. 7-16).

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. If you want to view, print, or save a file of current SNMP V1-2 users, select **Administration** → **Security** → **View SNMP Users** from the System View menu.

Steps

Perform the following steps to edit, delete, or enter SNMP V1-2 users.

1 From the System View menu, select **Administration** → **Security** → **Provision SNMP V1-2 Users.**

Result: The *Provision SNMP V1-2 Users* window opens to allow you to add, modify, or delete an SNMP V1-2 user.

The maximum number of provisionable SNMP users is 16. The NE maintains 4 default SNMP users for use in SNMP V3 applications.

2 Determine the required provisioning.

If...	Then...
add a new SNMP V1-2 user,	Continue with Step 3.
modify an existing SNMP V1-2 user,	Proceed to Step 4.
delete an existing SNMP V1-2 user,	Proceed to Step 5.

3 Perform the following to *ADD A NEW USER*:

1. Select **New User** in the SNMP User ID Panel.
2. Enter the User Identifier as a case-sensitive alphanumeric string of 6 to 20 characters in the box provided.
   Note that spaces are *not* allowed in the string of characters.
3. Click on the **Modify** button under SNMP User IP Address Panel.
   The Provision SNMP User IP Address window opens.
4. Enter the 32-bit IP address consisting of four dot-separated decimal numbers from 0–255. Click **OK**.
5. Under Request Functionality Control, select **Enable** or **Disable** to enable or disable request functionality (i.e., GetRequest, GetNextRequest, GetBulkRequest). Default is **Enabled**.
6. Under Trap Functionality Control, select **Enable** or **Disable** to enable or disable the SNMP User for receiving traps. Default is **Enabled**.
7. Click **Add** at the bottom of the window.

   Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

   Proceed to Step 6.

4 Perform the following to *MODIFY AN EXISTING USER*:

1. Select **Existing User** in the SNMP User ID Panel.
2. In the drop-down box, select (highlight) the user to be modified.

3. Under Request Functionality Control, select **Enable** or **Disable** to enable or disable request functionality (GetRequest, GetNextRequest, GetBulkRequest). Default is **Enabled**.
4. Under Trap Functionality Control, select **Enable** or **Disable** to enable or disable the SNMP User for receiving traps. Default is **Enabled**.
5. Click **Modify** at the bottom of the window.

   Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

   Proceed to Step 6.

5 Perform the following to *DELETE AN EXISTING USER*:

1. Select **Existing User** in the SNMP User ID Panel.
2. In the drop-down box, select (highlight) the user to be deleted.
3. Click **Delete** at the bottom of the window.

   Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

   Continue with Step 6.

6 Do you wish to perform additional SNMP User provisioning?

If...	Then...
Yes	Click **No** on the warning window and then return to Step 1. Note: If you select to NOT reset in this procedure, you must perform a Phase 3 reset (**Fault** → **Reset** → **System Controller**) before your changes take place.
No	Continue with Step 7.

7 Click **Yes** in the warning window to complete your SNMP provisioning.

Result: The following warning message appears: *The network element is resetting due to System Reset*.

8 Click **OK**.

Result: The System View closes, the network element resets, and all active users are disconnected.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

9 If you want to view, print, or save a file of current SNMP users, then log back into the network element and select **Administration** → **Security** → **View SNMP Users** from the System View menu.

END OF STEPS

Procedure 7-7: Allow/inhibit autonomous message reporting

Overview

Use this procedure to allow or inhibit autonomous message reporting for the current login session.

Allowing autonomous messages enables you to receive all active alarm and status conditions from the NE through autonomous messages for the current login session. Inhibiting this feature disables the reporting of all autonomous messages for the current login session.

Autonomous message reporting is allowed/inhibited on an individual user basis for the current login session. Every login session begins with the autonomous messages allowed.

Privilege level

You must log in as a Privileged, Administration, General, Maintenance, or Reports Only user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to enable/disable autonomous message reporting for this user for the current login session.

1 From the System View menu, select **Administration** → **Allow/Inhibit Autonomous Message Reporting** → **Current Session**.

Result: The *Allow/Inhibit Autonomous Messages* window opens. The current state of autonomous message reporting is displayed, Allow or Inhibit. Every login session begins with autonomous message reporting allowed.

2 **Important!** Autonomous message reporting is enabled (Allow) or disabled (Inhibit) on an individual user basis for the current login session.

Select **Allow** to enable autonomous message reporting for this session, or select **Inhibit** to disable reporting for this session, as required.

3 Did you change the autonomous message reporting state?

If...	Then...
Yes	Click **OK** at bottom of the window, read the caution message, then click **Yes** to execute the command.
No	Click **Cancel** to exit.

END OF STEPS

Procedure 7-8: Create or edit login banner

Overview

Use this procedure to create or edit a user defined login banner for an Alcatel-Lucent 1665 DMX shelf.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Determine the text you wish to appear on the login banner (you have a maximum of 11 lines with 62 characters per line).

Steps

Complete the following steps to create a user defined login banner.

1 From the System View menu, select **Administration** → **Change NE Login Banner**.

Result: The *Change Login Banner* window opens.

2 In the **Change Login Banner** panel, enter the text that you wish to appear on the login screen in the 11 lines provided.

Important! Adhere to the following rules when populating the login banner:

- The banner may contain up to 360 characters.
- Each line may contain up to 62 characters.
- The banner may begin on Line 1 or Line 2.
- Only one blank line may exist between each two populated rows.

3 Click **OK**.

4 Log out and back in to the NE to verify the changes to the Login Banner.

END OF STEPS

Procedure 7-9: Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds

Overview

Use this procedure to provision the following:

- Remote NE Status
- Alarm Gateway and Alarm Groups
- FTP and/or FTAM-FTP Gateway
- Security and History Log warning thresholds.

Privilege level

You must log in as a Privileged user to complete this procedure and its supporting elements.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision NE defaults.

1 From the System View menu, select **Administration** → **Set NE**.

Result: The *Set NE* window opens.

2 Reference the following, as required, to provision NE defaults:

- Procedure 7-9.1: "Provision alarm gateway, alarm groups, and remote NE status" (p. 7-27)
- Procedure 7-9.2: "Enable/disable FTP and/or FTAM-FTP (FTTD) gateway functions" (p. 7-29)
- Procedure 7-9.3: "Set security and/or history log thresholds" (p. 7-30)

END OF STEPS

Procedure 7-9.1: Provision alarm gateway, alarm groups, and remote NE status

Overview

> **Important!** This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26).

Use this procedure to provision alarm groups, alarm gateways, and remote NE status, as required. This procedure might best be performed after all network elements have been equipped, tested, and integrated into the network. See below.

AGNE

The Alarm Gateway parameter may have a value of **Enabled** or **Disabled** (default). Setting the value to **Enabled** designates the NE as an AGNE for its alarm group. One AGNE is needed for each alarm group to support the message communications for Remote NE Status feature. One other NE in the same alarm group may be provisioned as a backup AGNE, if required.

Any NE in an alarm group can be an AGNE. It is recommended that you do NOT provision an NE as both an AGNE and a TCP/IP GNE or TL1 GNE.

Remote NE Status must be **Enabled** in order to provision the NE as an AGNE. An NE with Remote NE Status (rnestat) **Enabled** but no AGNE in its alarm group reports an `AGNE Communications failure` alarm.

Alarm Groups

Alarm group has a numeric value of 1 through 255. The default is 255. All NEs with DCC connectivity, whether nearby or not, that have the same Alarm Group number are members of the same alarm group. All members of an alarm group share Remote NE Status information with each other but not with NEs in different alarm groups. All NEs in an alarm group must be in the same OSI area.

Remote NE Status must be **Enabled** in order to assign an alarm group number to the NE.

Remote NE Status

Remote NE status may be **Enabled**, **Enable Far-End**, or **Disabled** (default). When provisioned **Enabled**, the system activates support for the far-end activity LED, remote office alarms, and remote alarm/status reports.

When provisioned **Enable Far-End**, the SYSCTL LEDs and the office alarms only illuminate the FE LED; not the LEDs indicating the severity of the alarm. The SYSCTL LEDs and office panel LEDs that indicate the severity of alarms (CR, MJ, MN) only illuminate for local alarms. Except for the illumination of LEDs, selecting **Enable Far-End** behaves the same as selecting **Enabled**.

When provisioned **Disabled** (default), the system supports only local office alarms and local alarm/status reports. The far-end activity LED is not supported.

Steps

Perform the following steps to provision the alarm group functions.

1 For Remote NE Status, select **Enabled** or **Enable Far-End** to enable Remote NE Status.

Important! Remote NE Status must be provisioned **Enabled** or **Enable Far-End** in order to provision the alarm group functions.

2 If this NE will serve as an Alarm Gateway, select **Enabled** to provision this NE as an alarm gateway (AGNE). Otherwise, select **Disabled**.

An NE serving as a backup AGNE should have this parameter set to **Enabled**. In this configuration both NEs will actively serve as AGNEs to provide redundant alarm monitoring and distribution. The system does not assign one as primary and the other as secondary.

3 Enter the Alarm Group number (1–255) being assigned to this NE.

4 Ensure the other parameters in the window have not been changed, unless you are provisioning them also. Click **OK** at the bottom of the window.

5 Read the warning message, then click **Yes** to execute the command.

Important! An AGNE Communications failure alarm may occur if no AGNE has been selected for the alarm group. If you need to clear the alarm, select **Administration** → **Set NE**, then select **Disabled** to disable the Remote NE Status. You will have to enable the remote NE status again when the AGNE has been established in order for this NE to be part of the alarm group.

END OF STEPS

Procedure 7-9.2: Enable/disable FTP and/or FTAM-FTP (FTTD) gateway functions

Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26).

This procedure allows you to:

- Enable/Disable the NE for FTP file transfers to and from the NE. File transfers may be directly to and from an FTP-GNE, or through an FTP-GNE to/from an FTP enabled remote NE using IP Routing. Software downloads and provisionable database backup and restore are supported using FTP file transfers.
- Enable/Disable the NE as an FTAM-FTP Gateway (GNE). Enabling the NE as an FTAM-FTP Gateway allows the NE to act as a File Transfer Translation Device (FTTD) to perform file transfer translation between an FTP server and a remote NE using the FTAM protocol for file transfers.

  Important! Other provisioning may be necessary to use this function. Depending on your requirements, provisioning may include TCP/IP addressing and gateways, IP Routing, NSAP addresses, LAN port provision, and area routing.

Steps

Perform the following steps to Enable/Disable FTP and/or FTAM-FTP Gateway functions.

1 If FTP will be used on this NE, under File Transfer Protocol, select **Enabled** to enable FTP on this NE. Otherwise, select **Disabled** to disable FTP.

  Important! If this NE is also being provisioned as an FTAM-FTP Gateway, then File Transfer Protocol must also be **Enabled**.

2 If this NE will be used as an FTAM-FTP Gateway, under FTAM-FTP (FTTD) Gateway Control, select **Enabled** to enable this NE as an FTAM-FTP Gateway. Otherwise, select **Disabled**.

3 Click **OK** at bottom of the window.

END OF STEPS

Procedure 7-9.3: Set security and/or history log thresholds

Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26).

Use this procedure to set the Security Log Warning Threshold and/or the History Log Warning Threshold. The Threshold is the percentage of entries entered since the last *Security/History Log Overflow* event message was issued. When this threshold is reached another *Security/History Log Overflow* event message is issued and the threshold counter is reset to zero.

Steps

Perform the following steps to set the security/history log warning threshold.

1 Under Log Warning Threshold, select the parameter values required for the **Security Log Warning Threshold** and/or **History Log Warning Threshold**.

The Threshold may be disabled or set as a percentage of entries entered since the last *Security/History Log Overflow* event message was issued. Values may be entered from 10% to 100% in increments of 10%. The default is 90%.

Selecting **0%-Disabled** inhibits the issuing of the *Security/History Log Overflow* event message.

2 Click **OK** at bottom of the window, read the warning message, then click **Yes** to execute the command.

END OF STEPS

Procedure 7-10: Set date and time

Overview

Use this procedure to set the system date and time.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.

Select a source for your time setting. If you are manually setting the date and time, determine the correct time from an established source. If you are using NTP, identify the NTP server(s) to be used as source.

If you are using NTP, it is assumed that IP Routing has already been established or else each node has its own IP address.

Also, if you are using NTP, you will need to know the UTC Offset (UTCo) for the time zone in which the NTP client is located.

Default (Non-NTP) Method for Time and Date Synchronization

Upon initial system turnup, the date and time revert to January 1, 1970 (70-01-01) at midnight (00:00:00). Determine the correct time from an established source and manually set the date and time.

After initial system turnup if a system reset occurs, the system restores the current time.

NTP Method for Time and Date Synchronization

Upon initial system turnup or following a system reset, the date and time revert to January 1, 1970 (70-01-01) at midnight (000000). The NE (NTP client) queries for date and time from an NTP server (a list of NTP servers is maintained on the NE). NTP uses the Coordinated Universal Time (UTC) for synchronization.

For subsequent synchronization, the NTP client monitors all the NTP servers to determine the most reliable clock and compares the time reported with its current time (reliability is determined by clock selection procedures which include accessibility). If the time differs by more than the allowable amount of drift, it resets the time. The Alcatel-Lucent 1665 DMX NTP client adjusts its clock in small steps (gradually) or in a single step depending upon the significance of the offset from the system clock.

Steps

Complete the following steps to set the system time and date:

1 Do you plan to use the Network Time Protocol?

If...	Then...
Yes	Proceed to Step 7.
No	Continue with Step 2.

2 From the System View menu, select **Administration** → **Set Date and Time**.

Result: The *Set Date and Time* window opens.

3 From the **Date** panel, select the **Year** and **Month** from the pull-down menus.

Result: A calendar is displayed for the month and year selected.

4 Click on the date from the calendar.

5 You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking on the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

6 Click **OK**.

Result: The new date and time appear in the lower right hand corner of the *WaveStar*® CIT System View.

Stop! End of Procedure.

7 From the System View menu, select **Administration** → **Set Network Time Protocol**.

Result: The *Provision Network Time Protocol Server* window opens.

8 From the **Network Time Protocol** panel, select **Disabled**.

Important! Disabling NTP prevents the NE from receiving NTP information from the designated NTP server but allows you to enter provisionable data.

9 From the **Coordinated Universal Time Offset** panel, enter the number of **hours** and **minutes** from the pull-down menus to indicate the time difference from the UTC to the NTP client. Then select **plus (+)** or **minus (-)** to indicate the direction of change.

Important! In regions that observe Daylight Saving's Time, the Offset will need to be adjusted by one hour each time the time changes.

10 From the **Time Change Threshold** panel, select a number between 1 and 499. The number may be selected by sliding the pointer until the desired number appears in the box to the left, or by simply typing the desired number into the box.

The number entered represents the number of milliseconds of clock adjustment that will generate an autonomous message to the *WaveStar*® CIT and OS.

This message indicates that a significant time change has occurred and usually only appears at startup or system reset.

Important! Do not press Enter/Return on the keyboard if you opt to type in the number.

11 From the **Maximum Adjustment Threshold Milliseconds** panel, select a number between 500 and 10,000 (default is 1000). The number may be selected by sliding the pointer until the desired number appears in the box to the left, or by simply typing the desired number into the box.

The number entered represents the number of milliseconds of clock adjustment that will generate an autonomous message. This message indicates that certain scheduled operations may be effected (for example, performance monitoring), and usually only occurs at startup or system reset.

Important! Do not press Enter/Return on the keyboard if you opt to type in the number.

12 From the **Poll Interval** panel, select a **Minimum Poll Interval (seconds)** and a **Maximum Poll Interval (seconds)** from the pull-down menus. These numbers represent the least and most amount of time between the NTP client's queries to the server. Allowable values are between 16 and 16384 (seconds) and increment by powers of two (16, 32, 64... 16384). The default minimum is 64 seconds and the default maximum is 1024 seconds.

Selecting a higher minimum interval reduces the traffic generated by the poll. The poll interval gradually increases towards the maximum interval so long as the changes to the NE clock remain small and infrequent. If the changes to the clock become large and/or frequent, the poll interval shifts towards the minimum interval. NTP determines the interval that best maintains synchronization between the client and the server.

13 From the **Network Element's NTP Server(s)** panel, enter the IP address(es) of up to three known NTP Servers (It is recommended that a minimum of two servers be entered). NTP ranks these servers based upon availability and dependability. When a query is issued, NTP first attempts to synchronize with the most recently accessed server, and if it is unavailable, the query is issued to the highest ranked available server.

Note: There is no auto-discovery for NTP servers. This list must be entered and changed, manually.

Click the **Add NTP Server** button at the bottom of the screen. Enter the IP address of the server (each segment of the address should be entered in a separate box, sequentially across the screen).

Click **OK**.

Note: To remove an NTP server from the list, click to highlight one of the IP addresses in the NTP Server(s) IP Address(es) list. Click on Delete NTP Server button at the bottom of the screen.

14 Once you have completed the NTP form, click **Apply**.

15 From the **Network Time Protocol** panel, select **Enabled**. You will not be able to enter provisionable data while Enabled is selected.

Important! In order for NTP parameter changes to take effect, the NTP has to be disabled and then re-enabled.

16 Click **Apply** and then **Close**.

17 If required, select **Administration** → **View Network Time Protocol** and verify NTP status.

END OF STEPS

Procedure 7-11: Set/change system TID

Overview

Use this procedure to set or change the system Target Identifier (TID).

Important! The system TID is generally provisioned before the system is integrated into a network. Do not change the system TID unless you are reconfiguring the network and have been directed to do so.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the TID from your work instructions.

Steps

Complete the following steps to set or change the system Target Identifier (TID).

1 Obtain the TID (also known as NE Name) from the work instructions.

Important! The TID is a case-insensitive character string from 1 to 20 characters and must be unique for each NE in the ring. The allowed characters are

- Letters from "a" to "z" and "A" to "Z".
- Numbers from "0" to "9".
- Special characters "-" (hyphen) and "." (period).

2 From the System View menu, select **Administration** → **Set TID**, then:

1. In the **New TID:** box, enter the new TID.
2. Confirm your entry in the **Confirm TID:** box.
3. Click the **OK** button.
4. A warning message appears stating that the execution of this command will terminate all active login sessions. Read the message, then click **Yes**.

Result: The TID is changed, the system resets, and you are logged off the system.

After the TID of an existing BLSR node is changed, a **View** → **Refresh System View** *must* be performed at the remaining nodes in the BLSR network to update the source node (Location A) and destination node (Location Z) TIDs in the local cross-connection maps.

END OF STEPS

Procedure 7-12: Enable/disable OSI on an IAO LAN port

Overview

Use this procedure to enable or disable OSI communication for IAO LAN ports LAN-1 and/or LAN-2.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.

Steps

Perform the following steps to enable or disable OSI communication for IAO LAN ports LAN-1 and/or LAN-2.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

2 Select the **OSI LAN Management** tab.

Result: The IAO LAN parameters appear.

3 Enable/Disable the **OSI Function** parameter for IAO LAN ports LAN-1 and/or LAN-2 as required.

Important! OSI Function and TCP/IP Function cannot both be enabled on LAN-2.

Reference: Procedure 7-15: "Provision TCP/IP and Proxy ARP on an IAO LAN port" (p. 7-43)

4 Click **Apply** at bottom of the screen, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

END OF STEPS

Procedure 7-13: Provision network layer 3 parameters

Overview

This procedure allows you to perform the following:

- Modify the network service access point (NSAP) address
- Enable/disable Level 2 routing capabilities
- Enable/disable the NSAP count threshold level.

Important! Values should not be changed from default values except by users who intend to provision the SONET subnetwork and partition DCC communications.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision the network layer 3 parameters, as required.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

2

If...	Then...
modifying the NSAP address and/or enabling/disabling level 2 routing capabilities,	Continue with Step 3.
enabling/disabling the NSAP count threshold level,	Proceed to Step 8.

3 Select the **Network Layer** tab.

Result: The Network Layer parameters window opens.

4 NETWORK SERVICE ACCESS POINT

Click on the **Modify** button to the right of the NSAP address if you want to modify the NSAP address for this NE.

Important! The first eight characters of the NSAPs are always the same and cannot be changed. The remaining 18 characters of the NSAP area address are provisionable but only the Area field should be changed to assign a node to a different area. The remainder of the NSAP includes the System Identifier field, which is unique to each node, and the Selector (SEL) field.

Result: The *NSAP Provisioning* window opens.

5 Modify the user settable parameters as required, then click **OK**.

Result: The Network Layer parameters window opens again.

6 Select the desired Routing Capability for this NE as either **Level 1** or **Level 1&2**.

7 Click **Apply** at bottom of the window, read the warning message, then click **Yes** to execute the command or **No** to abort the command.

8 Select the **Network Threshold Alarming** tab.

Result: The Network Threshold Alarming parameters appear.

9 Provision the **Threshold Level** according to the work instructions and click **Apply**.

Important! If the threshold level is enabled and provisioned, the threshold level is used to monitor the number of NSAPs (OSI nodes) in the NE's level 1 area. When the NSAP count equals or exceeds the provisioned threshold, the system reports a minor alarm.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

10 Click **Close** to exit.

END OF STEPS

Procedure 7-14: Set TARP parameters

Overview

This procedure allows you to provision user settable fields and functions relating to the following TARP capabilities for this NE:

- TARP Propagation and Origination parameters
- TARP Data Cache entries
- TARP Manual Adjacencies.

Important! Values should not be changed from default values except by users who intend to provision the SONET subnetwork and partition DCC communications. All the Layer 4 parameters that can be provisioned and are needed for NE operation have default values. Therefore, it is not necessary to provision these parameters for the NE to operate in the network.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision TARP parameters, as required.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

2 TARP PARAMETERS

Select the **TARP** tab.

Result: The TARP parameters appear.

3 Select **Enable** to enable TARP Data Cache or **Disable** to disable TARP Data Cache.

4 Set the TARP Propagation Flush timer as required.

5 Provision the **TARP Lifetime** and **TARP Timers**, as required.

6 Click **Apply**, read the warning message, then click **Yes** to execute the command.

7 TARP DATA CACHE

Click on the **TARP Data Cache** tab.

Result: The *TARP Data Cache Entry List* appears.

8 Click on the sunglasses icon to add, modify, or delete entries. Follow the directions in the subsequent windows to edit the TARP Data Cache Entry **NE Name** and **NSAP**.

9 Click **Apply**.

10 TARP MANUAL ADJACENCIES

Click on the **TARP Manual Adj.** tab.

Result: The TARP Manual Adjacency parameters appear.

11 Up to two Manual Adjacencies may be provisioned. Select one to provision by clicking on the **Modify** button next to MAJ1: or MAJ2:.

Result: The *NSAP Provisioning* window opens.

12 Modify the NSAP as required, then click **OK**.

13 Click **Apply** at bottom of the window, read the warning message, then click **Yes** to execute the command or **No** to abort the command.

14 Click **Close** to exit.

END OF STEPS

Procedure 7-15: Provision TCP/IP and Proxy ARP on an IAO LAN port

Overview

Use this procedure to perform the following:

- Enable/Disable TCP/IP on an IAO LAN port
- Enable/Disable Proxy Address Resolution Protocol (Proxy ARP) on an IAO LAN port
- Provision the IP address and IP Subnet Mask of an IAO LAN port
- Provision IP Default Router Address if connecting to a default router (LAN-2 only).

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the LAN port(s) to be provisioned.
4. Verify that the work instructions specify the IP Address and IP Subnet Mask of the desired LAN port and the IP Default Router Address if it is connecting to a default router (LAN-2 only).

Steps

Perform the following steps to complete this procedure.

1 Determine which IAO LAN port(s) you want to use (front or rear).

Important! If you are using the rear IAO LAN port, use lan-2 as your AID. If you are using the front IAO LAN port, use lan-1 as your AID.

2 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

3 Click on the **TCP/IP** tab at the top of the window.

Result: The TCP/IP parameters display.

4 Select and/or modify the following parameters:

1. Select the **Port Aid:** (**LAN-1** [front] or **LAN-2** [rear]) being provisioned.
2. One at a time, click the **Modify** button to set the **IP Address** and **IP Subnet Mask** of the desired LAN port and the **IP Default Router Address**, if it is connecting to a default router (lan-2 only).

   When the provisioning window opens for the IP address being provisioned, enter the IP address as four dot-separated decimal numbers ranging from 0 to 255. Click **OK** to make your changes or **Cancel** to quit.
3. Select **Enable** to enable the **TCP/IP Function**, or **Disable** to disable the **TCP/IP Function**. Disabling the TCP/IP function on an IAO LAN port also causes enabled Proxy ARP to be disabled for the IAO LAN port.

   OSI Function and TCP/IP Function cannot both be enabled on LAN-2.
4. Select **Enable** to enable the **Proxy ARP**, or **Disable** to disable the **Proxy ARP**. To enable Proxy ARP on an IAO LAN port, the TCP/IP Function must also be enabled.

   For applications that require IP connectivity between IP-based operations systems and remote network elements (for example, SNMP and Network Time Protocol), enabling Proxy ARP on the Gateway Network Element (GNE) eliminates the need for static routes on the external router or OS host that is connected to the GNE via the IAO LAN interface.

   Important! If you enter duplicate IP addresses and/or IP subnet addresses, a warning appears: **Input, Data Not Valid, each IAO LAN port must have a unique IP subnet address**. Scroll through the Port AID drop-down menu and identify the duplication, then assign correct addresses as necessary.

   If you select **Enable** and click **Apply** to apply any changes, then execute the command when requested, the system will reset and you will be logged off the system. Selecting **Disable** allows you to stay logged on to the system to perform more provisioning. You can then come back to this window and enable the TCP/IP function.

   Reference: For an OS to establish a TCP/IP connection to or through a TL1 TCP/IP Gateway Network Element (GNE), the IP address must be entered at the TL1 TCP/IP GNE to authorize access. Refer to Procedure 7-16: “Provision/enable/disable the NE as a TL1 TCP/IP GNE” (p. 7-46).

5 Click **Apply** at the bottom of the window to make your changes.

Result: A warning window opens and asks if you want to execute this command.

6 Click **Yes** to execute the command.

Result: If you made changes that enabled the TCP/IP function, the changes are applied, the system resets, and you are logged off the system. If you made changes and disabled the TCP/IP function, the changes are applied and you are still logged off the system.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

7 If you wish to enable the second port, return to Step 2.

8 Click **Close** when you want to exit window, if you are still logged into the system.

END OF STEPS

Procedure 7-16: Provision/enable/disable the NE as a TL1 TCP/IP GNE

Overview

Use this procedure to provision, enable, or disable the Alcatel-Lucent 1665 DMX as a TL1 TCP/IP GNE.

Privilege level

You must login as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. If the GNE is connected to the IP WAN via an IAO LAN interface, complete Procedure 7-15: "Provision TCP/IP and Proxy ARP on an IAO LAN port" (p. 7-43) to provision and enable TCP/IP for the selected LAN port. If the GNE is connected to the IP WAN through another vendor's network element using an IP over DCC link, complete Procedure 6-4: "Provision DCC terminations" (p. 6-12) and Procedure 7-17: "Provision static IP routes on DCC links" (p. 7-49) to enable IP over DCC and specify the static IP routes on the selected DCC port.
4. Verify that the work instructions specify the LAN port to be provisioned.
5. Verify that the work instructions specify the IP calling addresses, host names (optional), and host types for the OS hosts which will be allowed access to the Alcatel-Lucent 1665 DMX TL1 TCP/IP GNE.
6. Using office records, verify that the network element has the latest software release (recommended).

Steps

Perform the following steps to complete this procedure.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

2 In the *Data Communications* window, click on the **TCP/IP** tab.

Result: The TCP/IP parameters display.

3 Verify that TCP/IP is properly provisioned and enabled for the required LAN port or DCC port. If TCP/IP is enabled for a DCC port, verify that the IP static route is provisioned on the selected DCC port.

Reference:

- Procedure 7-15: "Provision TCP/IP and Proxy ARP on an IAO LAN port" (p. 7-43)
- Procedure 6-4: "Provision DCC terminations" (p. 6-12)
- Procedure 7-17: "Provision static IP routes on DCC links" (p. 7-49)

4 In the *Data Communications* window, click on the **TCP/IP Gateway** tab.

Result: The TCP/IP Gateway parameters display.

5 Enable or Disable the **TCP/IP Gateway Function** as required.

6 From your work instructions, determine which IP calling addresses will be allowed to access the Alcatel-Lucent 1665 DMX TL1 TCP/IP GNE.

7 **Important!** Changes to an existing IP map entry (OS Host IP address, OS Host Name or OS Type) will not impact any existing connections to the corresponding OS. For example, if an OS Host IP address is removed from the table, and a connection to that OS is currently present, that connection is maintained until the user manually terminates the connection.

Use the instructions on the screen to add, modify, or delete a gateway host from the **TCP/IP Gateway Host List**.

The following parameters apply:

- The Host IP address is four dot-separated decimal numbers, each ranging from 0 to 255.
- The Host Name may consist of 1 to 24 alpha-numeric characters (optional field)
- The Host OS Type may consist of standard types or listed as other.

Repeat this step for each of the Host IP addresses you want to authorize for access to the Alcatel-Lucent 1665 DMX TL1 TCP/IP GNE. There may be up to 20 provisioned entries in the list.

8 Click **Apply** at the bottom of the window.

Result: A warning window opens and asks if you want to execute this command.

9 Click **Yes** to execute the command, then click **Close** to exit window, if desired.

10 Repeat this procedure for each TL1 TCP/IP GNE to be modified, enabled, or disabled.

END OF STEPS

Procedure 7-17: Provision static IP routes on DCC links

Overview

Use this procedure to add/modify/delete static IP routes on DCC links. The static routes are added into the routing table and used to forward IP packets through the provisioned outgoing DCC interfaces to reach the destination IP addresses.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the required DCC port *AID*, *Destination IP*, *Destination IP Subnet Mask*, and the required provisioning.
4. If adding a static route, verify that *IP over DCC* is enabled for the required DCC port using the **View** → **DCC Terminations** command to access the *View DCC Terminations* window. If required, refer to Procedure 6-4: "Provision DCC terminations" (p. 6-12) to provision the required DCC port.

Steps

Perform the following steps to add/modify/delete static IP routes on DCC links.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* window opens.

2 Click on the **IP Routing** tab at the top of the window.

Result: The *IP Routing* parameters display.

3 In the *Manual Routes* panel, click on the edit icon (glasses) to add/modify/delete an entry.

Result: The *Add/Modify/Delete a Manual Route* window opens

4 Select the required DCC port from the **AID:** drop-down list. Enter the **Destination IP** and **Destination IP Subnet Mask** parameters according to the work instructions, and click **Add**/**Modify**/**Delete**, as required.

Result: The *Add/Modify/Delete a Manual Route* window closes

5 Click **Apply** to execute the command.

6 Repeat Step 3 through Step 5 to provision other static routes on DCC links; otherwise, click **Close**.

END OF STEPS

Procedure 7-18: Provision RS232 CIT (CIT-1) and/or MODEM (CIT-2) serial port parameters

Overview

Use this procedure to:

- Set or change the baud rate for the serial ports.
- Enable or disable command echo mode.
- Assign OS type application context IDs (ACIDs) to the serial ports.

Assigning an acid to a serial port determines the TL1 autonomous message types to be output by the local network element (NE), and any TL1-RNEs (remote NEs) accessed through that serial port.

Important! Changing the serial port parameters may affect access to the serial port. Changing settings for the front RS232 CIT (cit-1) port may affect *WaveStar*® CIT local access. Changing settings for the MODEM (cit-2) port may affect modem communications, if applicable.

Privilege level

An Administration, General, Maintenance, or Reports Only user may provision a serial port only if they are logged in to that serial port. A Privileged user may provision a serial port while logged in to that serial port or while not logged in to that serial port.

Important! Changing the baud rate on the serial port requires that you first change the baud rate on the NE before changing the baud rate of the COM port on the PC.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision the serial ports.

1 From the System View menu, select **Administration** → **Data Communications**.

Result: The *Data Communications* parameters window opens.

2 Select the **Serial Port** tab.

Result: The Serial Port parameters appear.

3 Select the **CIT Port** (**`cit-1`** or **`cit-2`**) you want to provision.

Important! Changing the serial port parameters may affect access to the serial port.

4 Note the **Access State** of the selected CIT Port. If the **Access State** is **`In Service`** you may continue to provision accessible parameters for the serial port. If the **Access State** is **`Lockout`**, only a Privileged user may provision the parameters at this time.

An **Access State** of **`Lockout`** indicates that login access to all ports has been locked out except for Privileged users.

Administration → Security → Enable Lockout Security State Administration → Security → Disable Lockout Security State

Reference: Procedure 7-3: "Edit, delete, or enter a user's login" (p. 7-11)

5 Provision the Serial Port Parameters as required.

- **Echo Mode** – Specifies whether or not TL1 messages received on the port are echoed back to the user. Values are **`enabled`** or **`disabled`**. The *WaveStar*® CIT temporarily disables the echo when launched and re-enables it when closed. Enabling the Echo after launching the *WaveStar*® CIT can cause the *WaveStar*® CIT to operate improperly.
- **Baud Rate** – Specifies the baud rate at which TL1 messages are transmitted/received on the port. Values are **`1200`**, **`2400`**, **`4800`**, **`9600`** (default), or **`19200`**.
  Changing the baud rate terminates any active login sessions on the selected port.
- **OS Type** – Only Privileged users may assign/change ACIDs. Specifies the Application Context Identifier from the following values:
  - **`TL1PeerComm`** (By default, no autonomous messages). **`TL1PeerComm`** is the default OS Type for cit-2.
  - **`TL1Maintenance`** (By default, all autonomous messages except for Database changes)
  - **`TL1MemoryAdministration`** (By default, Database Change messages only)
  - **`TL1Test`** (By default, all autonomous messages except for PM reports). **`TL1Test`** is the default OS Type for cit-1.
  - **`TL1CR`** (By default, no autonomous messages possible)
  - **`TL1OTHER1`** (By default, all autonomous messages except report PM)
  - **`TL1OTHER2`** (By default, no autonomous messages)

6 In the **Apply To** box, select **`This CIT Port only`** if the changes only apply to the selected port. Or, select **`Both CIT Ports`** to apply the changes to both cit-1 and cit-2.

7 Click **Apply** at bottom of the window, read the warning message, then click **Yes** to execute the command.

Important! If you changed the baud rate setting, you will be logged off the system and the system view will close. Changing the OS Type on a port logs out any active user on the port.

Other serial port provisioning takes effect at the current session only after a command is sent to the NE. Click on the **Alarm List** button from the System View menu to send a command to the NE.

8 If you changed the CIT baud rate setting, you must now change the COM port baud rate setting for the *WaveStar*® CIT. From the *WaveStar*® CIT network view, select **Administration → Serial COM Selection**.

9 Select the serial port (**`COM-1`** or **`COM-2`**) and Baud Rate setting used for serial communication. Click **OK** to change the setting.

Important! The baud rate setting must be the same as the NE CIT port setting.

END OF STEPS

Procedure 7-19: Map TL1 message types to OS applications

Overview

Use this procedure to map TL1 autonomous message types to an OS type application context ID (ACID). TL1 autonomous messages are not reported unless they are assigned to an OS type. This command allows a user to assign specific TL1 autonomous message types, or none at all.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure, particularly all relevant ACID/OS requirements.

Steps

Complete the following steps to map TL1 message types to the OS.

1 From the System View menu, select **Administration** → **Set TL1 Message Map**.

Result: The *Set TL1 Message Map* window opens.

2 From the **TL1 Message Type List**, select one of the following ACIDs from the **OS Type** column

- **TL1MAINTENANCE** — Maintenance To be used by the systems that monitor alarms and performance monitoring. Defaults All autonomous messages except for Database Changes.
- **TL1MEMORYADMINISTRATION** — Memory Administration To be used by systems that provision cross-connections. Defaults Database Changes autonomous messages ONLY.
- **TL1TEST** — Test (Use with *WaveStar*® CIT) Defaults All autonomous messages except for REPT PM.
- **TL1PEERCOM** — Peer Communications Defaults NO autonomous messages.
- **TL1OTHER1** — All autonomous messages except for REPT PM.
- **TL1OTHER2** — NO autonomous messages.

3 For the selected OS type, verify the desired status (**ENABLED** or **DISABLED**) for each of the following Message Types:

- **Alarm** — Reports the occurrence of alarms.
- **Environment** — Reports the occurrence of environmental alarms.
- **Conditions** — Periodically reports the active status conditions (every six hours beginning at midnight).
- **Database Changes** — Reports the occurrence of provisioning changes.
- **Events** — Reports the occurrence of status conditions (events).
- **Performance Monitoring** — Reports performance monitoring data on a scheduled basis.
- **Protection Switch** — Reports automatic equipment protection switches.
- **Connection Changes** — Reports control plane connection changes.
- **Connection Events** — Reports control plane connection events.

4 To change an **ENABLED**/**DISABLED** status, double-left-click on the status cell and select the correct status from the drop-down menu.

5 Continue from Step 2 until all types have been correctly defined.

6 Click **OK** at bottom of the window, read the warning message, then click **Yes** to execute the command or **No** to abort the command.

END OF STEPS

Procedure 7-20: Enable/disable user ID(s)

Overview

Use this procedure to:

- Disable a non-default user's ID
- Disable all non-default user IDs
- Enable a user's ID that was previously disabled
- Enable all user IDs.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the User ID(s) to be enabled or disabled.

Steps

Complete the following steps to enable/disable a non-default user ID(s).

1

If the non-default user ID(s) is to be...	Then...
enabled,	Continue with Step 2.
disabled,	Proceed to Step 4.

2 From the System View menu, select **Administration** → **Security** → **Enable User Login**.

Result: The *Enable User Login* window opens.

3

If enabling...	Then...
one non-default user ID,	Select the user ID and click *This Login*. Then click **OK**. **STOP! End of Procedure**.
all user IDs,	Click *All Logins*. Then click **OK**. **STOP! End of Procedure**.

4 From the System View menu, select **Administration** → **Security** → **Disable User Login**.

Result: The *Disable User Login* window opens.

5

If disabling...	Then...
one non-default user ID,	Select the user ID and click *This Login*. Then click **OK**. **STOP! End of Procedure**.
all non-default user IDs,	Click *All Logins*. Then click **OK**. **STOP! End of Procedure**.

END OF STEPS

Procedure 7-21: Provision network element security

Overview

Use this procedure to provision the following network element level security parameters:

- User ID Lockout Threshold
- User ID Aging Period
- Minimum Waiting Period Before Password Changes
- User ID Lockout Interval
- User ID Lockout Aging Period
- Change Password Status
- Access Control List Status.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify the network element security parameters to be provisioned and the new values.

Steps

Complete the following steps to provision the network element level security parameters.

1 From the System View menu, select **Administration** → **Security** → **Provision NE Security**.

Result: The *Provision NE Security* window opens.

2 Provision the network element security parameters according to your work instructions and click **OK**.

- *User ID Lockout Threshold*: The maximum number of consecutive invalid login attempts that are allowed by a User ID. When the number of invalid login attempts reaches the provisioned threshold, the User ID is locked out for the provisioned period of time. After a successful login attempt, the count of invalid login attempts by that User is reset to zero. The value is 2–99 consecutive failed attempts; default is 5. A value of 0 or selecting **Disable** disables the lockout threshold.
- *User ID Aging Period*: If a User ID is not used during the provisioned time interval, it is disabled. User ID aging does not apply to the three default logins. The value is 0–999 days; default is 60. A value of 0 or selecting **Disable** disables user ID aging.
- *Minimum Waiting Period Before Password Changes*: If the *Password Aging Interval* (number days before a user has to change his/her password) is enabled (7–999 days), the Minimum Waiting Period before Password Changes value MUST be less than the Password Aging Interval. The value is 0–30 days; default is 20. A value of 0 or selecting **Disable** disables the minimum waiting period.
- *User ID Lockout Interval*: When the number of invalid login attempts reaches the provisioned threshold, the User ID is locked out for this provisioned period of time. After the provisioned period expires, login attempts are allowed from that User ID. The value is 0–99 minutes; default is 10. A value of 0 or selecting **Disable** disables the lockout interval.
- *User ID Lockout Aging Period*: The time period during which the number of invalid login attempts are counted. When the Lockout Aging Period expires, the counter of invalid login attempts by that User ID is reset to zero. The value is 1–999 minutes; default is 60.
- *Change Password Status*: Enables or disables the requirement to change a password when the password is first used in a new login ID or after the password is changed by a System Administrator. The default is **Disable**.
- *Access Control List Status*: Enables or disables the Access Control List. The default is **Disable**.

  Before you can change *Access Control List Status* to **Enable**, you must provision at least one access control list (**Administration** → **Security** → **Provision Access Control**).

END OF STEPS

Procedure 7-22: Log out user(s)

Overview

Use this procedure to log out an active user (including another privileged user) or all active users (excluding privileged and administration users) from the network element.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the user ID(s) of the user(s) to be logged out.

Steps

Complete the following steps to log out another user(s).

1 From the System View menu, select **Administration** → **Security** → **Logout NE User**.

Result: The *Logout NE User* window opens.

2

If logging out...	Then...
one user,	Select the user ID and click *This login*. Then click **OK**. A dialog box appears asking you to confirm logging out the user. Click **Yes**.
all non-privileged and non-administration users and the executing user's login session,	Select *All logins* and click **OK**. A dialog box appears asking you to confirm logging out all applicable users. Click **Yes**.

3 From the System View menu, select **Administration** → **Security** → **View Logged-In Users** to obtain a list of logged-in users and verify that the desired user(s) have been logged out. Click **Close** to exit.

END OF STEPS

Procedure 7-23: Allow/inhibit port/tributary maintenance

Overview

Use this procedure to change the following:

- Port maintenance state of existing ports
- Tributary maintenance state of existing tributaries.

To provision the default port maintenance and default tributary maintenance parameters for new ports/tributaries that are created, refer to Procedure 6-2: "Provision shelf/system parameters" (p. 6-8).

Port maintenance

Access to the loopback and test transmission commands for ports is controlled using the Port Maintenance parameter. If the Port Maintenance parameter is provisioned to *Allow*, loopbacks and transmission testing are allowed on the port. Existing loopbacks and current transmission tests are not changed.

If the Port Maintenance parameter is provisioned to *Inhibit*, new loopbacks and transmission testing are not allowed on the port. If the port already has a loopback provisioned or is being transmission tested, attempting to change the Port Maintenance parameter to Inhibit is denied.

Tributary maintenance

Access to the test access commands for tributaries is controlled using the Tributary Maintenance parameter. If the Tributary Maintenance parameter is provisioned to *Allow*, test access is allowed on the tributary. Test access that is already provisioned is not changed.

If the Tributary Maintenance parameter is provisioned to *Inhibit*, new test access provisioning is not allowed using the tributary. If the tributary already has test access provisioned, attempting to change the Tributary Maintenance parameter to Inhibit is denied.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to change the port/tributary maintenance state of an existing port/tributary.

1

If...	Then...
Allowing/inhibiting port maintenance on an existing port,	select **Administration** → **Allow/Inhibit Port Maintenance**.
Allowing/inhibiting tributary maintenance on an existing tributary,	select **Administration** → **Allow/Inhibit Tributary Maintenance**.

Result: The *Allow/Inhibit Port/Tributary Maintenance* window opens.

2 Find the circuit pack with the port/tributary being provisioned, then expand the equipment list by clicking on the plus (+) sign next to the circuit pack and port (if required). Select the required port/tributary and click **Select**.

3 Select **Allow** or **Inhibit** according to the work instructions and click **Apply**.

For more information about Port Maintenance and Tributary Maintenance, refer to "Port maintenance" (p. 7-61) and "Tributary maintenance" (p. 7-61).

4 If required, repeat Step 2 and Step 3 to change the port/tributary maintenance state on other existing ports/tributaries; otherwise, click **Close** to exit.

END OF STEPS

Procedure 7-24: Provision RADIUS server

Overview

Use this procedure to provision a Remote Authentication Dial In User Service (RADIUS) server on your network for authentication.

An Authentication Server simplifies the authentication and management of users in a large network. One such type of Authentication Server supports the Remote Authentication Dial In User Service (RADIUS) protocol as defined by RFC 2865.

To accomplish the authentication in a secure manner, the RADIUS client and RADIUS server must both be configured with the same shared secret. This secret is used to generate one-way encrypted authenticators that are present in all RADIUS packets. The secret is never transmitted over the network.

To use RADIUS authentication, you need to create an authentication login list, which uses RADIUS as the primary authentication method, and local authentication as a backup method in the event that the RADIUS server cannot be contacted. The authentication list is then associated with the default login.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Step

Complete the following steps to provision a Remote Authentication Dial In User Service (RADIUS) server on your network for authentication.

1 From the System View menu, select **Administration** → **Security** → **Provision Radius Server**.

Result: The *Provision Radius Server* window opens.

2 Provision the parameters as required. See Table 7-1, "Radius configuration parameters" (p. 7-64).

3 Click **Create** to create a server or **Delete** to delete a server.

4 **Important!** The system-level RADIUS Authentication parameter must be Enabled to provision the local network element as a RADIUS client.

Select **View** → **Equipment** to access the system-level parameters and verify that the RADIUS Authentication parameter is Enabled for the network element.

If required, select **Configuration** → **Equipment** to access the system-level parameters and enable RADIUS Authentication for the network element.

Reference: Procedure 6-2: "Provision shelf/system parameters" (p. 6-8)

END OF STEPS

Radius Server

Table 7-1 Radius configuration parameters

CIT	Description	TL1 ent-radius-server command parameter
Radius Server Attributes Panel		
IP Address	This is the IP Address of the RADIUS Server. Valid values: four dot-separated decimal numbers in the range of 0 to 255. The value 0.0.0.0 is an invalid IP Address. This is a required parameter.	ipaddr
Role	This parameter indicates whether the RADIUS Server is a primary or secondary one. This is a required parameter. Valid values: Primary or Secondary Only one primary and one secondary RADIUS servers are allowed to be provisioned.	role
Port Number	Port Number. It identifies the UDP port number for RADIUS. The valid values are integers from 1 to 65535. This is an optional parameter. The initial value is 1812.	port

Table 7-1 Radius configuration parameters (continued)

CIT	Description	TL1 ent-radius-server command parameter
Secret	Secret. It identifies the shared secret between the RADIUS client and the RADIUS server. Valid values are case-sensitive strings of 1 to 128 characters, with characters @ , : = " ; * \ ! ? not being allowed due to their special TL1 meanings.	secret

Procedure 7-25: Edit, delete, or enter SNMP V3 users

Overview

Use this procedure to provision SNMP V3 management access to the system.

To provision SNMP V1-2 management access to the system, refer to Procedure 7-6: "Edit, delete, or enter SNMP V1-2 users" (p. 7-19).

To provision SNMP V3 tables, refer to Procedure 7-26: "Provision SNMP V3 tables" (p. 7-69).

To provision SNMP contact/location information and enable/disable SNMP authentication failure traps, refer to Procedure 7-5: "Provision system SNMP management features" (p. 7-16).

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.
3. If you want to view, print, or save a file of current SNMP V3 users, select **Administration** → **Security** → **View SNMP Users** from the System View menu.

Steps

Perform the following steps to edit, delete, or enter SNMP V3 users.

1 From the System View menu, select **Administration** → **Security** → **Provision SNMP V3 Users.**

Result: The *Provision SNMP V3 Users* window opens to allow you to add, modify, or delete an SNMP V3 user.

Tthe maximum number of provisionable SNMP users is 16. The NE maintains 4 default SNMP users for use in SNMPv3 applications.

2 Determine the required provisioning.

If...	Then...
add a new SNMP V3 user,	Continue with Step 3.
modify an existing SNMP V3 user,	Proceed to Step 4.
delete an existing SNMP V3 user,	Proceed to Step 5.

3 Perform the following to *ADD A NEW USER*:

1. Select **New User** in the SNMP User ID Panel.
2. Enter the User Identifier as a case-sensitive alphanumeric string of 6 to 20 characters in the box provided.
   Note that spaces are *not* allowed in the string of characters.
3. Provision the required parameters according to the work instructions.
4. Click **Add** at the bottom of the window.

   Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

   Proceed to Step 6.

4 Perform the following to *MODIFY AN EXISTING USER*:

1. Select **Existing User** in the SNMP User ID Panel.
2. In the drop-down box, select (highlight) the user to be modified.
3. Provision the required parameters according to the work instructions.
4. Click **Modify** at the bottom of the window.

   Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

   Proceed to Step 6.

5 Perform the following to *DELETE AN EXISTING USER*:

1. Select **Existing User** in the SNMP User ID Panel.
2. In the drop-down box, select (highlight) the user to be deleted.
3. Click **Delete** at the bottom of the window.

   Result: A warning message appears stating that a reset is required before any SNMP provisioning changes take effect and that a reset causes all active login sessions to be logged out.

   Continue with Step 6.

6 Do you wish to perform additional SNMP V3 User provisioning?

If...	Then...
Yes	Click **No** on the warning window and then return to Step 1. Note: If you select to NOT reset in this procedure, you must perform a Phase 3 reset (**Fault** → **Reset** → **System Controller**) before your changes take place.
No	Continue with Step 7.

7 Click **Yes** in the warning window to complete your SNMP V3 provisioning.

Result: The following warning message appears: *The network element is resetting due to System Reset*.

8 Click **OK**.

Result: The System View closes, the network element resets, and all active users are disconnected.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

9 If you want to view, print, or save a file of current SNMP users, then log back into the network element and select **Administration** → **Security** → **View SNMP Users** from the System View menu.

END OF STEPS

Procedure 7-26: Provision SNMP V3 tables

Overview

Use this procedure to provision, create, or delete SNMP V3 tables.

To provision SNMP V3 management access to the system, refer to Procedure 7-25: "Edit, delete, or enter SNMP V3 users" (p. 7-66).

To provision SNMP contact/location information and enable/disable SNMP authentication failure traps, refer to Procedure 7-5: "Provision system SNMP management features" (p. 7-16).

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to provision, create, or delete SNMP V3 tables.

1 From the System View menu, select **Administration → Security → Provision SNMP Tables**.

Result: The *Provision SNMP Tables* window opens to allow you to provision, create, or delete an SNMP table.

2 Determine the required provisioning.

If...	Then...
adding a new SNMP table,	Continue with Step 3.
modifying an existing SNMP table entry,	Proceed to Step 4.
deleting an existing SNMP table entry,	Proceed to Step 5.

3 Perform the following to *ADD A NEW TABLE*:

1. Select the **Create** Operation.
2. Select the SNMP Table to be created and click **Create** at the bottom of the window.
3. Provision the required parameters and attribute values according to the work instructions.
4. Click **Apply** at the bottom of the window.

Proceed to Step 6.

4 Perform the following to *MODIFY AN EXISTING TABLE ENTRY*:

1. Select the **Provision** Operation.
2. Select the SNMP Table entry to be modified and click **Provision** at the bottom of the window.
3. Provision the required attribute values according to the work instructions.
4. Click **Apply** at the bottom of the window.

Proceed to Step 6.

5 Perform the following to *DELETE AN EXISTING TABLE ENTRY*:

1. Select the **Delete** Operation.
2. Select the SNMP Table entry to be deleted and click **Delete** at the bottom of the window.
3. Verify the SNMP Table entry to be deleted and click **Apply** at the bottom of the window.

Continue with Step 6.

6 Do you wish to perform additional SNMP Table provisioning?

If...	Then...
Yes	Return to Step 2.
No	STOP! End of Procedure.

END OF STEPS

Procedure 7-27: Provision access control

Overview

Use this procedure to create or delete Access Control List entries.

Up to 50 different entries can be included on the access control list.

Access control list

The access control list adds a layer of control in addition to the TL1 user ID and password. When the access control list is enabled, an IP-based OS can log in to a remote target NE via a GNE (T-TD) only if the GNE, represented by its TID or NSAP, is included on the target network element access control list.

An OSI-based OS can log in to a remote target NE only if the OSI-based OSI, represented by its NSAP, is included on the target network element access control list.

Important! Specifying a GNE's NSAP is more secure than specifying the TID. Since the TID is provisionable and are generally available, a user attempting unauthorized access to the NE could present a TID that duplicates a TID on the access control list, thereby, bypassing the security provided by the access control list.

Privilege level

You must log in as a Privileged or Administration user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 7-3) and "Required equipment" (p. 7-3) in this chapter.
2. Obtain the work instructions for this procedure.

Steps

Perform the following steps to add or delete Access Control List entries.

1 **Important!** The network element security Access Control List Status parameter must be Enabled to use the Access Control List.

Before you can change *Access Control List Status* to **Enable**, you must provision at least one access control list (**Administration** → **Security** → **Provision Access Control**).

If required, select **Administration** → **Security** → **Provision NE Security** to access the NE security parameters and enable the Access Control List Status parameter. Click **OK**.

Reference: Procedure 7-21: "Provision network element security" (p. 7-58)

2 From the System View menu, select **Administration** → **Security** → **Provision Access Control**.

Result: The *Provision Access Control* window opens to allow you to create or delete an Access Control List entry.

3 Determine the required provisioning.

If...	Then...
adding an Access Control List entry,	Continue with Step 4.
deleting an Access Control List entry,	**Important!** The network element security Access Control List Status parameter must be Disabled if all the access control lists are deleted. If required, select **Administration** → **Security** → **Provision NE Security** to access the NE security parameters. On the *Provision NE Security* window, disable the Access Control List Status parameter and click **OK**. Proceed to Step 5.

4 Perform the following to *ADD AN ACCESS CONTROL LIST ENTRY*:

1. Provision the NSAP Address and/or TID according to the work instructions.
2. Click **Create** at the bottom of the window.

Proceed to Step 6.

5 Select the required Access Control List entry to be deleted and click **Delete** at the bottom of the window.

Note: If you delete all of the Access Control List entries, you must also disable access control. If required, select **Administration** → **Security** → **Provision NE Security** to access the NE security parameters. On the *Provision NE Security* window, disable the Access Control List Status parameter and click **OK**.

Proceed to Step 6.

6 Do you wish to perform additional Access Control List provisioning?

If...	Then...
Yes	Return to Step 3.
No	Click **Close** at the bottom of the window. STOP! End of Procedure.

END OF STEPS

8 System performance monitoring procedures

Overview

Purpose

Use the procedures in this chapter to view or provision performance monitoring parameters from the System View **Performance** menu.

Depending on local procedures, types of configurations, and shelf equipage, some or none of the optional parameters may need to be provisioned. It is assumed that local system administration is responsible for determining these parameter values.

Some of the parameter values may be provisioned during the initial shelf turn-up. Other parameter values may be provisioned after the system is integrated into the network configuration.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

All procedures in this chapter require that a Personal Computer (PC) with *WaveStar*® CIT software installed is available.

Procedure 8-1: View performance monitoring (PM) thresholds

Overview

Use this procedure to view performance monitoring (PM) thresholds for ports or tributaries.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to view PM thresholds.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to view PM thresholds.

1 From the System View menu, select either **Performance** → **View Near-End PM Threshold** or **Performance** → **View Far-End PM Threshold**, as required, then select the desired port rate or tributary rate.

Result: The *View ( ) Near-End PM Threshold* or *View ( ) PM Far-End Threshold* window opens for the port or tributary rate selected.

2 View the parameters and threshold values, then at the bottom of the window, click the appropriate button as required: **Save As**, **Print**, **Refresh**, **Close**, or **Help**.

END OF STEPS

Procedure 8-2: Provision performance monitoring (PM) thresholds

Overview

Use this procedure to provision performance monitoring (PM) thresholds for ports or tributaries.

Privilege level

You must log in as a Privileged, General, or Maintenance user to provision PM thresholds.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to provision PM thresholds.

1 From the System View menu, select either **Performance** → **Prov Near-End PM Threshold** or **Performance** → **Prov Far-End PM Threshold**, as required, then select the desired port rate or tributary rate.

Result: The *Provision ( ) Near-End PM Threshold* or *Provision ( ) PM Far-End Threshold* window opens for the port or tributary rate selected.

2 In the table, find the required PM parameter and double-click inside the table cell for the desired threshold being provisioned. Enter or edit the required threshold values. Repeat for each threshold being provisioned.

3 After all required threshold values are entered, click **OK** at the bottom of the window.

END OF STEPS

Procedure 8-3: Initialize performance monitoring (PM) registers

Overview

Important! Executing this procedure will reset and clear the PM register(s) selected. Ensure you want to execute this procedure before continuing.

Use this procedure to initialize all current 15-minute and/or current 1-day PM registers. PM registers for the *previous* 15-minute and *previous* 1-day time periods are not affected.

Privilege level

You may log in as a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to initialize (clear) the current 15-minute and/or current 1-day PM registers.

1 Which register do you wish to initialize?

If ...	Then...
current 15-minute registers	Continue with Step 2.
current 1-day registers	Proceed to Step 5.
current 15-minute and current 1-day registers	Proceed to Step 8.

2 From the System View menu, select **Performance** → **Initialize PM Registers** → **15-Min**.

Result: A dialog box appears asking you to confirm executing this command.

3 Click **Yes**.

Result: All current 15-minute PM registers are cleared. PM registers for the *previous* 15-minute time periods are not affected.

4 STOP! End of Procedure.

5 From the System View menu, select **Performance** → **Initialize PM Registers** → **1-Day**.

Result: A dialog box appears asking you to confirm executing this command.

6 Click **Yes**.

Result: All current 1-day PM registers are cleared. PM registers for the *previous* 1-day time periods are not affected.

7 STOP! End of Procedure.

8 From the System View menu, select **Performance** → **Initialize PM Registers** → **Both**.

Result: A dialog box appears asking you to confirm executing this command.

9 Click **Yes**.

Result: All current 15-minute and current 1-day PM registers are cleared. PM registers for the *previous* 15-minute and *previous* 1-day time periods are not affected.

END OF STEPS

Procedure 8-4: View performance monitoring (PM) settings

Overview

Use this procedure to view the provisioned performance monitoring and TCA reporting parameters for a port, tributary, or VCG.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to view performance monitoring and TCA reporting parameters.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to view performance monitoring and TCA reporting parameters.

1 From the System View menu, select **Performance** → **View PM Settings**.

Result: The *View PM* window opens.

2 Expand the details for the required Function group or main circuit pack with the ports, tributaries, or VCGs being viewed. Click on the required port, tributary, or VCG you want to view, then click **Select**.

3 View the desired parameters, then at the bottom of the window, click the appropriate button as required: **Refresh**, **Close**, or **Help**.

END OF STEPS

Procedure 8-5: Provision performance monitoring (PM) settings

Overview

Use this procedure to perform the following:

- Enable/disable performance monitoring on a port, tributary, or VCG
- Enable/disable threshold crossing alert (TCA) reporting on a port, tributary, or VCG.

Privilege level

You must log in as a Privileged, General, or Maintenance user to provision performance monitoring and TCA reporting parameters.

DWDM/TDM alarm, performance monitoring, and threshold crossing alert reporting

The following table shows the port/tributary provisionable parameters that affect DWDM/TDM alarm, performance monitoring, and threshold crossing alert reporting.

TCA Monitoring Mode Parameter	Port/Tributary Monitoring Mode (Primary State) Parameter		
	IS	AUTO (Note)	NMON (Note)
Enable	Yes Alarm Reporting Yes PM Reporting Yes TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting
Disable	Yes Alarm Reporting Yes PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting
Note: The AUTO and NMON primary states do not apply to high-speed OC-n lines.			

Ethernet alarm, performance monitoring, and threshold crossing alert reporting

The following table shows the Ethernet port/VCG provisionable parameters that affect Ethernet alarm, performance monitoring, and threshold crossing alert reporting.

Ethernet Port/VCG PM Enable	TCA Monitoring Mode = Enable (Note)		
	Port/VCG Monitoring Mode		
	IS	AUTO	NMON
Enable	Yes Alarm Reporting Yes PM Reporting Yes TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting
Disable	Yes Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting
Note: If the TCA monitoring mode parameter is disable, TCA reporting is disabled.			

Data alarm, performance monitoring, and threshold crossing alert reporting

The following table shows the Data port provisionable parameters that affect Data alarm, performance monitoring, and threshold crossing alert reporting.

Data Port PM Enable	TCA Monitoring Mode = Enable (Note)		
	Port Monitoring Mode		
	IS	AUTO	NMON
Enable	Yes Alarm Reporting Yes PM Reporting Yes TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting
Disable	Yes Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting	No Alarm Reporting No PM Reporting No TCA Reporting
Note: If the TCA monitoring mode parameter is disable, TCA reporting is disabled.			

The following table shows the Data VCG provisionable parameters that affect Data alarm and performance monitoring reporting.

Data VCG PM Enable	VCG Monitoring Mode		
	IS	AUTO	NMON
Enable	Yes Alarm Reporting Yes PM Reporting	No Alarm Reporting No PM Reporting	No Alarm Reporting No PM Reporting

Data VCG PM Enable	VCG Monitoring Mode		
	IS	AUTO	NMON
Disable	Yes Alarm Reporting No PM Reporting	No Alarm Reporting No PM Reporting	No Alarm Reporting No PM Reporting

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to provision performance monitoring and TCA reporting.

1 From the System View menu, select **Performance** → **Prov PM Settings**.

Result: The *Provision PM* window opens.

2 **Important!** During initial ring turn up, the default value for the port PJC Monitoring Point parameter may produce constant PM counts. To prevent constant PM counts, provision the port PJC Monitoring Point parameter to an unused tributary.

Expand the details for the required Function group or circuit pack with the ports, tributaries, or VCGs being provisioned. Click on the required port, tributary, or VCG you want to provision, then click **Select**.

3 Provision parameters as required and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command.

4 Read the warning message and click **Yes** to execute the command. Click **Close** to exit.

END OF STEPS

Procedure 8-6: View performance monitoring (PM) reports

Overview

Use this procedure to view performance monitoring (PM) reports.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to view performance monitoring reports.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to view PM reports.

1 From the System View menu, select **Performance** → **View PM/Statistics Report** then select the entity you want to report.

Result: The *( ) PM Report* window opens for the selected entity;

or, if **Performance** → **View PM/Statistics Report** → **TCA** was selected, the TCA report is displayed automatically. Proceed to Step 6.

2 Expand the details for the required group/circuit pack and port (if necessary). Highlight the entity from which you want to report and then click **Select**.

Result: A parameter selection details window opens.

3 Select the **Time Period** (*1 Day* or *15 Min*).

4 Which **Time Period** did you select?

If ...	Then...
1 Day	Select values for the following parameters: • **Monitored Date** (*Current Date*, *Previous Date* or *Both*) • **Monitor Level** (*1-UP* or *0-UP*)

If ...	Then...
15 Min	Select values for the following parameters: • **Number of Bins** (*All* or *Single*) If the **Number of Bins** selected is *Single*, you must also select a time period from the **Monitored Time** drop-down list. • **Monitor Level** (*1-UP* or *0-UP*)

5 **Important!** The following menu selections do *not* display Near End and Far End tabs because far-end performance monitoring is not supported. The parameters that are available for selection are near-end PM parameters.

- DS1 Line (if the signal format of the selected port is *Super Frame*, *Super Frame - Near-End Only*, or *Unframed*).

  If the signal format of the selected port is *Ext. Super Frame - Near and Far End*, the Near End and Far End tabs are available.
- DS1 Path (if the signal format of the selected port is *Super Frame*, *Super Frame - Near-End Only*).

  If the signal format of the selected port is *Ext. Super Frame - Near and Far End*, the Near End and Far End tabs are available. DS1 ports with a provisioned signal format of *Unframed* do not support DS1 Path PM and are not available for selection from this menu.
- E1 Line
- DS3 Line
- DS3 Path (if the signal format of the selected port is *Framed*)

  If the signal format of the selected port is *C-Bit*, the Near End and Far End tabs are available. DS3 ports with a provisioned signal format of *Clear Channel* do not support DS3 Path PM and are not available for selection from this menu.
- OCN Section
- OCH Line
- OTS Line
- OTU2 Line
- ODU2 Section
- Ethernet
- Ethernet QoS
- Data

Select the Near End and/or Far End Tab as required and select the parameters to report for each tab. Click **Apply**.

Result: The *( ) PM Report* is displayed. If you selected parameters on both tabs, the resulting report includes parameters designated as NEND (Near End) and FEND (Far End).

Performance monitoring for cross-connections is done at the incoming signal rates, not at the cross-connection rate. For example, an STS-12c cross-connection could consist of 1 STS-12c signal, 4 STS-3c signals, 12 STS-1 signals, or a mix of STS-3c and STS-1 signals. Therefore, a single request could return a report for several entities.

6 At the bottom of the window, click the appropriate button as required: **Save As**, **Print**, **Refresh**, **Close**, **Reset**, or **Help**.

7 If required, click **Close** on the *( ) PM Report* window.

END OF STEPS

Procedure 8-7: Schedule performance monitoring (PM) reports

Overview

This procedure allows a user to schedule Performance Monitoring reports on Alcatel-Lucent 1665 DMX. Performance monitoring can be scheduled to provide quarter hour and daily reports beginning at different time intervals.

In order to schedule PM reports, PM messaging must be enabled and you must use the *WaveStar*® CIT TL1 cut-through mode.

Important! The *WaveStar*® CIT Graphical User Interface (GUI) does not, at this time, support this command.

If you are unfamiliar with the parameters in this procedure, refer to **SCHED-PMREPT** in the *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*.

Privilege level

You must log in as a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Complete the following steps to schedule PM. The NE supports up to a maximum of 100 active scheduled PM reports, counting every aid as many times as it is scheduled (aid values that include ALL are counted multiple times). The NE accepts each **SCHED-PMREPT** as a request for a different scheduled PM report unless two requests are exact duplicates. The **SCHED-PMREPT** command does not generate a **REPT DBCHG** message.

1 **Important!** The port/tributary/VCG monitoring mode (primary state) parameter must be IS (in-service) to enable performance monitoring.

Verify that performance monitoring is enabled (port/tributary/VCG monitoring mode is IS) for the required port, tributaries, and/or VCGs.

Reference: Procedure 8-4: "View performance monitoring (PM) settings" (p. 8-7)

2 From the *WaveStar*® CIT System View menu, verify that the Performance Monitoring (PM) message type has been enabled for the OS Application Type being used by selecting **Administration** → **Set TL1 Message Map**.

Reference: Procedure 7-19: "Map TL1 message types to OS applications" (p. 7-54)

3 From the *WaveStar*® CIT System View menu, select **File** → **NE Disconnect** and click **Yes** in the resulting confirmation window.

4 From the Network View, log back into the NE but this time click **TL1**, not Graphical.

5 Select the *Cut Through Execution Mode* and click **OK**.

6 Log in to the network element using the **`act-user`** TL1 command. Enter your user ID and password. Defaults are **LUC01** and **DMX2.5G10G**, respectively.

7 Schedule the required PM report using the **`sched-pmrept`** TL1 command.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*

Performance monitoring for cross-connections is done at the incoming signal rates, not at the cross-connection rate. For example, an STS-12c cross-connection could consist of 1 STS-12c signal, 4 STS-3c signals, 12 STS-1 signals, or a mix of STS-3c and STS-1 signals. Therefore, a single request could return a report for several entities.

END OF STEPS

Procedure 8-8: Clear threshold crossing alert (TCA) counts

Overview

Important! Executing the command in this procedure will reset and clear the threshold crossing alert (TCA) counts. Ensure you want to execute this procedure before continuing.

Use this procedure to clear threshold crossing alert (TCA) counts.

Privilege level

You may log in as either a Privileged, General, Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 8-2) and "Required equipment" (p. 8-2) in this chapter.

Steps

Perform the following steps to clear TCA counts.

1 From the System View menu, select **Fault** → **Clear TCA Count**.

Result: A dialog box appears asking you to confirm executing this command.

2 Click **Yes**.

Result: The TCA counts are cleared.

END OF STEPS

9 Network configuration procedures

Overview

Purpose

This chapter includes procedures necessary to configure an Alcatel-Lucent 1665 DMX network.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedures, that additional equipment is listed in that procedure.

Procedure 9-1: Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network

Overview

Use this procedure to establish an end-to-end Alcatel-Lucent 1665 DMX high-speed:

- OC-3/12/48/192 UPSR
- OC-48/192 BLSR
- OC-3/12/48/192 1+1 linear (Main-to-Main)
- OC-3/12/48 1+1 linear (Main-to-Function/Growth)
- OC-3/12/48/192 0x1 unprotected optical extension (VLF OLIU circuit packs only)

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs/pluggable transmission modules, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. During initial ring turn up, the default value for the port PJC Monitoring Point parameter may produce constant PM counts. To prevent constant PM counts, provision the port PJC Monitoring Point parameter to an unused tributary. Refer to Procedure 8-5: "Provision performance monitoring (PM) settings" (p. 8-8).

Steps

Complete the following steps to establish an end-to-end Alcatel-Lucent 1665 DMX system.

1 **Important!** The network element TID (target identifier) must be unique in the network.

From the System View at the starting node,

1. Select **Administration** → **View NE Administration**.
2. Verify that the *NE Parameters* and *NSAP* are provisioned correctly using the work instruction and/or office records.
3. Click **Close**.
4. If provisioning changes are required, refer to the appropriate procedure(s) in Chapter 7, "System administration procedures".
5. Repeat this step at each node in the network.

2

If establishing a high-speed...	Then...
UPSR network,	Proceed to Procedure 9-1.1: "Establish high-speed UPSR network" (p. 9-5).
BLSR network,	Proceed to Procedure 9-1.2: "Establish high-speed BLSR network" (p. 9-11).
1+1 linear extension (Main-to-Main) network,	Proceed to Procedure 9-1.3: "Establish high-speed 1+1 linear (Main-to-Main) network" (p. 9-18).
1+1 linear extension (Main-to-Function/ Growth) network,	Proceed to Procedure 9-1.4: "Establish high-speed 1+1 linear (Main-to-Function/ Growth) network" (p. 9-24).
0x1 unprotected optical extension,	Proceed to Procedure 9-1.5: "Establish high-speed 0x1 unprotected optical extension" (p. 9-30).

END OF STEPS

Procedure 9-1.1: Establish high-speed UPSR network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3).

Steps

Important! This procedure assumes that the UPSR is established by interconnecting Alcatel-Lucent 1665 DMX nodes using the OC-3/12/48/192 *Main* slot pair. However, the Main slot pair of the Alcatel-Lucent 1665 DMX may also be connected in a UPSR with the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48/192 Main slot pair or OC-3/12/48 Function/Growth slot pair. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1850 TSS-5 using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1850 TSS-5, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Operations Guide, 365-372-401*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMXplore using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXplore, refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMX using OC-3/12/48 Function/Growth slot pair. If connecting to the Function/Growth slot pair of another Alcatel-Lucent 1665 DMX, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102), as required, when performing this procedure.

Nodes are provisioned and optical spans are established individually around the UPSR starting with an Alcatel-Lucent 1665 DMX shelf designated as the starting node. Continue around the UPSR in the same direction until all nodes are provisioned.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs/pluggable transmission modules, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a high-speed UPSR network.

1 **Important!** For UPSR applications, the port Application parameter must be provisioned *UPSR*.

From the System View menu at the starting node, select **Configuration** → **Equipment** to access the Main 1 and 2 ports and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 Select **View** → **Equipment** command to access the Main 1 and 2 ports and verify that the ports were provisioned correctly.

3 At each node in the UPSR, provision the port parameters according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Repeat Step 1 and Step 2 to provision and verify the required OC-n ports.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required OC-n ports.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision and verify the required OC-n ports.

4 **Important!** The LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu at the starting node,

1. Select **Configuration** → **DCC Terminations**
2. Select the required DCC Port *dcc-m1-{1-8}*, provision **OSI Over DCC** as *enabled*, and the **LAPD Role** as *user-side*.
3. Click **Apply** to make changes.
4. Select the required companion DCC Port *dcc-m2-{1-8}*, provision **OSI Over DCC** as *enabled*, and the **LAPD Role** as *network-side*.
5. Click **Apply** to make changes.
6. Click **Close**.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

5 From the System View menu, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly, and click **Close**.

6 At each node in the UPSR, provision the DCC terminations according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Repeat Step 4 and Step 5 to provision and verify the required DCC terminations.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required DCC terminations.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision and verify the required DCC terminations.

7 **Important!** Synchronization Autoreconfiguration is only provisionable if the system Timing Mode parameter is *Line* and the Sync Messaging parameter of all ports is *enabled*. If the Sync Messaging parameter is enabled at any port in the network, it must be enabled at all ports in the network.

If required at the starting node, provision the synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

8 If required at each node in the UPSR, provision synchronization functions according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Repeat Step 7 to provision the required synchronization functions.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision the required synchronization functions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision the required synchronization functions.

9 **Important!** If Remote NE Status is to be used, at least one network element must be provisioned as the Alarm Gateway Network Element (AGNE) in the network. If the network element is designated as the Alarm Gateway Network Element (AGNE), the Alarm Gateway parameter must be provisioned *Enabled*.

From the System View menu at the starting node, select **Administration** → **Set NE**, provision the *Remote NE Status*, *Alarm Group*, and *Alarm Gateway* parameters according to the work instructions, and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

Reference: Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

10 At each node in the UPSR, provision Remote NE Status functions according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Repeat Step 9 to provision the required Remote NE Status functions.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision the required Remote NE Status functions.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision the required Remote NE Status functions.

11 Beginning with the starting optical span, connect the fibers between the Main-1 circuit pack at the starting node and the adjacent node and verify the integrity of the optical span being established.

If the adjacent node is an...	Then connect to the...
Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore and the Main slots are used,	Main-2 circuit pack. Refer to the other product's documentation, as required, to connect the fibers and verify the integrity of the optical span.
Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend and the Function/Growth slots are used,	Function/Growth circuit pack in Slot 1. Refer to the other product's documentation, as required, to connect the fibers and verify the integrity of the optical span.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

12 Perform end-to-end optical line test.

Reference: Procedure 14-7: “Perform end-to-end optical line test on Main OLIUs” (p. 14-63)

13 Continue around the UPSR in the same direction until all nodes are connected.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Repeat Step 11 and Step 12 to connect and test the optical span.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: “Establish subtending low-speed UPSR/BLSR” (p. 9-102) to connect and test the optical span.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product’s documentation to connect and test the optical span.

14 At each node in the UPSR, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 The UPSR is now ready for initial service to be established.

Important! Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Procedure 9-1.2: Establish high-speed BLSR network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3).

Steps

Important! This procedure assumes that the BLSR is established by interconnecting Alcatel-Lucent 1665 DMX nodes using the OC-48/192 *Main* slot pair. However, the Main slot pair of the Alcatel-Lucent 1665 DMX may also be connected in a BLSR with the Function/Growth slot pair of another Alcatel-Lucent 1665 DMX. If connecting to the Function/Growth slot pair of another Alcatel-Lucent 1665 DMX, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102), as required, when performing this procedure.

Nodes are provisioned and optical spans are established individually around the BLSR starting with an Alcatel-Lucent 1665 DMX shelf designated as the starting node. Continue around the BLSR in the same direction until all nodes are provisioned. (Refer to the 2-fiber bidirectional line switched ring worksheet at the end of this procedure when performing this procedure.)

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a high-speed OC-48/192 BLSR.

1 **Important!** For BLSR applications, the port Application parameter must be provisioned *2F BLSR*.

Up to 15 BLSR protection groups may be supported by a single network element when the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

From the System View menu at the starting node, select **Configuration** → **Equipment** to access the Main 1 and 2 ports and provision the port parameters according to the work instructions.

Result: The system reports a default K-bytes alarm.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 Select **View** → **Equipment** to access the Main 1 and 2 ports and verify that the ports were provisioned correctly.

3 At each node in the 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure), repeat Step 1 and Step 2 to provision and verify the required main OC-n ports.

If an Alcatel-Lucent 1665 DMX is using a Function/Growth slot pair, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required OC-n ports.

4 From the system view at the starting node,

1. Select **Configuration** → **Equipment**.
2. Select the **Ring ID** tab and expand the required ring by clicking on the plus sign (+).
3. Click on the required 2F BLSR main-1-{1, 2, 5} protection group and **Select**.
4. Provision the required protection group parameters according to the work instructions, then click **Apply** and **Close**. If no changes were made, click **Close** and go to the next step.

5 From the System View menu,

1. Select **View** → **Protection**.
2. Select *2F BLSR main-1-{1, 2, 5}* and click **Select**.
3. Click on the *Provisionable Parameters* tab and verify that the protection group parameters were provisioned correctly. Then click **Close**.

6 At each node in the 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure), repeat Step 4 and Step 5 to provision and verify the main 2-fiber BLSR protection group.

If an Alcatel-Lucent 1665 DMX is using a Function/Growth slot pair, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required 2-fiber BLSR protection group.

7 Determine the status of Automatic Ring Discovery.

If automatic ring discovery was...	Then...
enabled at each node, (Release 3.0 and later releases),	Continue with Step 8.
disabled at each node (manual ring discovery),	At the starting node, establish a new manual ring map. Repeat this step at each node in the 2-fiber BLSR. Procedure 9-4: "Provision manual ring map" (p. 9-65)

8 **Important!** The LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu at the starting node,

1. Select **Configuration** → **DCC Terminations**
2. Select DCC Port *dcc-m1-{1, 2, 5}*, provision **OSI Over DCC** as *enabled*, and the **LAPD Role** as *user-side*.
3. Click **Apply** to make changes.
4. Select DCC Port *dcc-m2-{1, 2, 5}*, provision **OSI Over DCC** as *enabled*, and the **LAPD Role** as *network-side*.
5. Click **Apply** to make changes.
6. Click **Close**.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

9 From the System View menu, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly, and click **Close**.

10 At each node in the 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure), repeat Step 8 and Step 9 to provision and verify the DCC terminations for the Main ports.

If an Alcatel-Lucent 1665 DMX is using a Function/Growth slot pair, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required DCC terminations.

11

Important! Synchronization Autoreconfiguration is only provisionable if the system timing mode is *Line* and the Sync Messaging parameter of all ports is *enabled*. If the Sync Messaging parameter is enabled at any port in the network, it must be enabled at all ports in the network.

If required at the starting node, provision synchronization functions according to work instructions.

Repeat this step at each node in the 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure).

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

12

Important! If Remote NE Status is to be used, at least one network element must be provisioned as the Alarm Gateway Network Element (AGNE) in the network. If the network element is designated as the Alarm Gateway Network Element (AGNE), the Alarm Gateway parameter must be provisioned *Enabled*.

From the System View menu at the starting node, select **Administration** → **Set NE**, provision the *Remote NE Status*, *Alarm Group*, and *Alarm Gateway* parameters according to the work instructions, and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

Reference: Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

Repeat this step at each node in the 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure).

13

Beginning with the starting optical span (refer to the 2-fiber BLSR worksheet at the end of the procedure), connect the fibers between the Main-2 circuit pack at the starting node and the Main-1 circuit pack at the adjacent East node and verify the integrity of the optical span being established.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

14 Perform end-to-end optical line test.

Reference: Procedure 14-7: “Perform end-to-end optical line test on Main OLIUs” (p. 14-63)

15 Repeat Step 13 and Step 14 for each optical span in the 2-fiber BLSR (refer to the 2-fiber BLSR example and worksheet at the end of the procedure).

If connecting to a Function/Growth slot pair at an Alcatel-Lucent 1665 DMX, refer to Procedure 9-9: “Establish subtending low-speed UPSR/BLSR” (p. 9-102) to connect and test the optical span.

16

If automatic ring discovery was...	Then...
enabled at each node (in Step 4),	**Important!** As the ring is connected, nodes automatically communicate with each other using the data communications channel (DCC) and build a ring map. If successful, automatic ring discovery builds a ring map at each node and the `Ring Discovery in Progress` condition clears. If unsuccessful, the ring map is not complete and alarms are reported. At the host node, select **View** → **Ring Map** → **Ring Map**. Then click on the appropriate ring and **Select**. The ring map information appears. If the ring is incomplete and alarms are present, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.
disabled at each node (in Step 4),	Continue with Step 17.

17 At the starting node, verify 2-fiber BLSR protection switching:

1. Select **Fault** → **Protection Switch**. Select *2F BLSR main-1-{1, 2, 5}* and click **Select**. Choose the **East** or **West** direction with switch type **Manual to Protection, Ring**. Click **Apply**.
2. Select **View** → **Protection**. Select *2F BLSR main-1-{1, 2, 5}* and click **Select**. Observe the Ring Node APS (Automatic Protection Switch) State, East Switch Request State, West Switch Request State, East Channel Status, and West Channel Status parameters. Verify the 2-fiber BLSR protection switch was performed.
3. Select **Fault** → **Protection Switch**. Select *2F BLSR main-1-{1, 2, 5}* and click **Select**. Choose the required direction with switch type **Clear**. Click **Apply**.

Repeat this step at each node in the 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure) to verify protection switching.

18 At each node in the 2-fiber BLSR, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 The 2-fiber BLSR is now ready for initial service to be established.

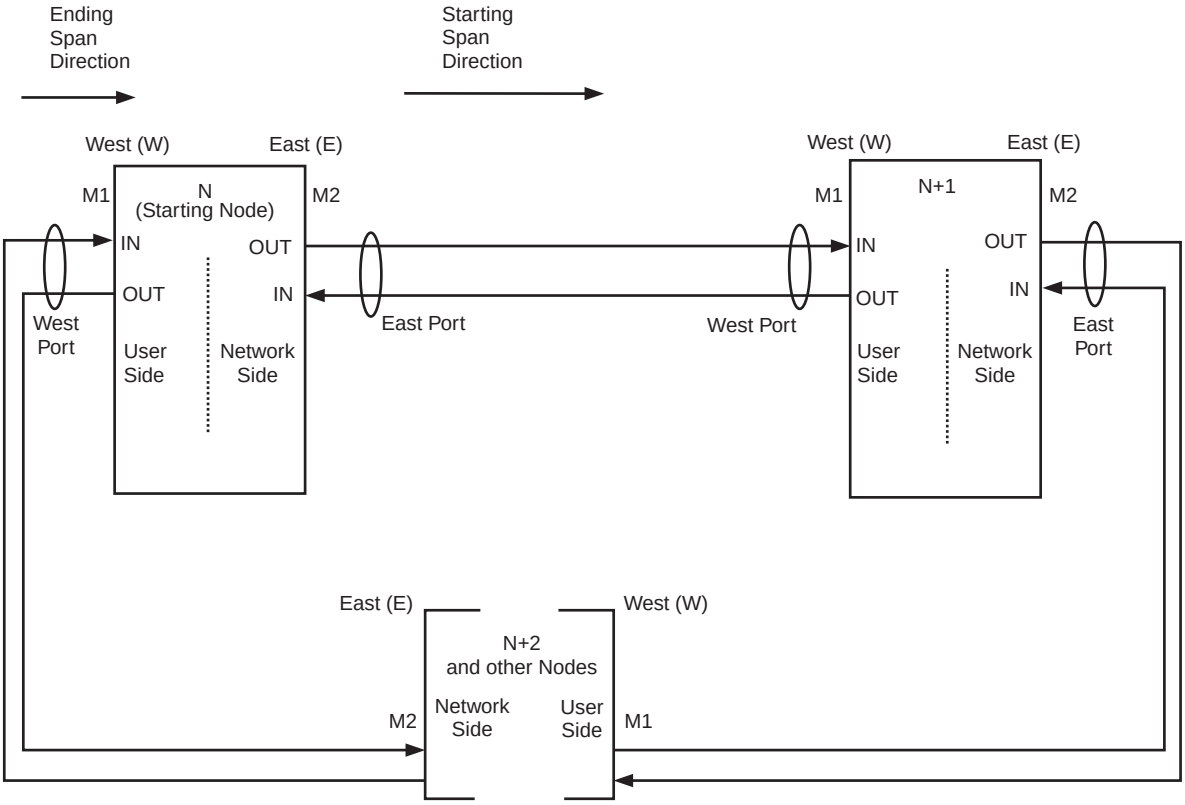
Important! Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

2-Fiber Bidirectional Line Switched Ring Worksheet



nc-usm-368

2-FIBER RING WORKSHEET _____ SPAN NAME/ID _____

N	N+1
TID=	TID=
Ring ID: _____	Node ID: _____
Node ID: _____	Protection Group AID _____
Protection Group AID _____	IN Fiber Color/ID _____
OUT Fiber Color/ID _____	Received Power Level _____
IN Color/ID _____	Required IN PAD _____
Received Power Level _____	OUT Fiber Color _____
Required LBO _____	

NC-USM-216

Procedure 9-1.3: Establish high-speed 1+1 linear (Main-to-Main) network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3).

Steps

Important! This procedure assumes that the 1+1 linear network is established by interconnecting two Alcatel-Lucent 1665 DMX nodes using the OC-3/12/48/192 *Main* slot pair. However, the Main slot pair of the Alcatel-Lucent 1665 DMX may also be connected in a high-speed 1+1 linear network with either of the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48/192 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMXplore using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXplore, refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*, as required, when performing this procedure.

This procedure assumes that the near-end node is an Alcatel-Lucent 1665 DMX and the far-end node is either a Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, or Alcatel-Lucent 1665 DMXplore. Refer to the 1+1 linear worksheet at the end of this procedure when performing this procedure.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a high-speed 1+1 linear (main-to-main) network.

1 **Important!** There are three 1+1 configurations: Unidirectional 1+1 (referred to as 1+1), Bidirectional 1+1, and Optimized 1+1.

The port Application parameter must be provisioned *1+1* at both ends of the system, *Optimized 1+1* at both ends of the system, or *Bidirectional 1+1* at both ends of the system. *Bidirectional 1+1* is required when interworking with other vendor's

equipment that does *not* bridge DCC traffic on the active and standby lines. (Alcatel-Lucent 1665 DMX supports bridging DCC traffic on the active and standby lines.)

Alcatel-Lucent 1665 DMXtend does not support *Optimized 1+1*.

Alcatel-Lucent 1665 DMXplore does not support *Optimized 1+1* or *Bidirectional 1+1*.

From the System View menu at the near-end node, select **Configuration** → **Equipment** to access the Main 1 and 2 ports and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

Important! The port Application parameter may be changed from 1+1 to 1+1 Bidirectional or from 1+1 Bidirectional to 1+1 when cross-connections exist on the line pair.

2 Select **View** → **Equipment** to access the Main 1 and 2 ports and verify that the ports were provisioned correctly.

3 From the System View menu, select **Configuration** → **Equipment**. Select the system (AID=system), then click **Select** at the bottom of the window.

If required, provision the *1+1 Protection Priority* (unidirectional 1+1 applications only) and *Wait To Rename* (Optimized 1+1 applications only) parameters. Click **Apply** if changes were made, then click **Yes** to the warning message to make your changes. Click **Close** to exit.

4 **Important!** The protection group *Revertive Mode* and *Wait to Restore* parameters apply to unidirectional 1+1 applications and Bidirectional 1+1 applications only.

If the *Revertive Mode* parameter is disabled, the *Wait to Restore* parameter is not provisionable.

If required, from the System View menu,

1. Select **Configuration** → **Equipment**.
2. Select the **Ptn Grp** tab.
3. Click on the required 1+1 protection group and **Select**.
4. Provision the required protection group parameters according to the work instructions, then click **Apply** and **Close**. If no changes were made, click **Close** and go to the next step.

5 If required, from the System View menu,

1. Select **View** → **Protection**.
2. Select the required 1+1 protection group and click **Select**.
3. Verify that the protection group parameters were provisioned correctly. Then click **Close**.

6 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for DCC port *dcc-m-{1-8}* according to the work instructions.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

7 From the System View menu, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly and click **Close**.

8 **Important!** Synchronization Autoreconfiguration is only provisionable if the system Timing Mode parameter is *Line* and the Sync Messaging parameter of all ports is *enabled*. If the Sync Messaging parameter is enabled at any port in the network, it must be enabled at all ports in the network.

If required, provision synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

9 **Important!** If Remote NE Status is to be used, at least one network element must be provisioned as the Alarm Gateway Network Element (AGNE) in the network. If the network element is designated as the Alarm Gateway Network Element (AGNE), the Alarm Gateway parameter must be provisioned *Enabled*.

From the System View menu, select **Administration** → **Set NE**, provision the *Remote NE Status*, *Alarm Group*, and *Alarm Gateway* parameters according to the work instructions, and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

Reference: Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

10 At the far-end node, provision the Main ports, DCC terminations, synchronization, and Remote NE Status functions according to the work instructions.

If the far-end node is an...	Then...
Alcatel-Lucent 1665 DMX,	Repeat Step 1 through Step 9.
Alcatel-Lucent 1665 DMXtend or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision the required Main ports, DCC terminations, synchronization, and remote NE status functions.

11 **Important!** The near-end circuit pack in the Main 1 slot must be connected to the far-end circuit pack in the Main 1 slot, and the near-end circuit pack in the Main 2 slot must be connected to the far-end circuit pack in the Main 2 slot. Refer to the 1+1 linear worksheet.

Connect the optical fibers and verify the integrity of the optical span being established.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

12 Perform end-to-end optical line test.

Reference: Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)

13 At each node in the 1+1 linear network, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

14 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

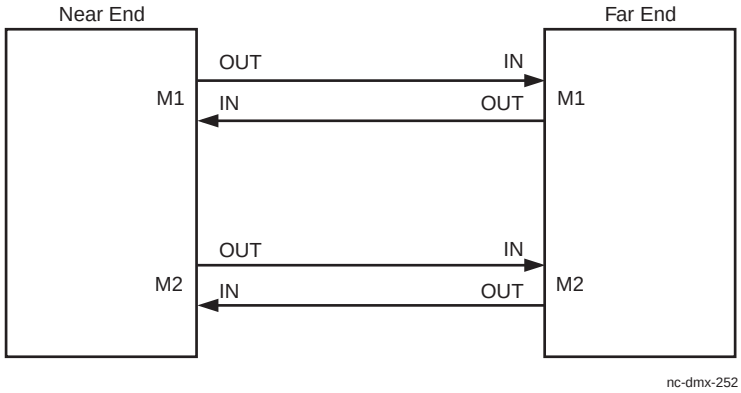
The 1+1 linear network is now ready for initial service to be established.

Reference:

- Chapter 10, "TDM service provisioning procedures"
- Chapter 11, "Ethernet/Data network provisioning procedures"

END OF STEPS

1+1 Linear Worksheet (Main-to-Main)



TID= Protection Group AID _____	TID= Protection Group AID _____
M1 OUT Fiber Color/ID _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____	Port _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____ OUT Fiber Color/ID _____
M2 OUT Fiber Color/ID _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____	Port _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____ OUT Fiber Color/ID _____

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Procedure 9-1.4: Establish high-speed 1+1 linear (Main-to-Function/Growth) network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3).

Steps

Important! This procedure assumes that the high-speed 1+1 linear network is established by interconnecting the OC-3/12/48 *Main* slot pair of the Alcatel-Lucent 1665 DMX to an OC-3/12/48 Function/Growth slot pair of another Alcatel-Lucent 1665 DMX. However, the OC-3/12/48 Main slot pair of the Alcatel-Lucent 1665 DMX may also be connected to an OC-3/12/48 Function/Growth slot pair of a Alcatel-Lucent 1665 DMXtend. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.

This procedure assumes that the near-end node is the Main slot pair of a Alcatel-Lucent 1665 DMX and the far-end node is the Function/Growth slot pair of a Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend. Refer to the 1+1 linear worksheet at the end of this procedure when performing this procedure.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs/pluggable transmission modules, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a high-speed 1+1 linear (main-to-function/growth) network.

1 **Important!** There are three 1+1 configurations: Unidirectional 1+1 (referred to as 1+1), Bidirectional 1+1, and Optimized 1+1.

The port Application parameter must be provisioned *1+1* at both ends of the system, *Optimized 1+1* at both ends of the system, or *Bidirectional 1+1* at both ends of the system. *Bidirectional 1+1* is required when interworking with other vendor's equipment that does *not* bridge DCC traffic on the active and standby lines. (Alcatel-Lucent 1665 DMX supports bridging DCC traffic on the active and standby lines.)

Alcatel-Lucent 1665 DMXtend does not support *Optimized 1+1*.

From the System View menu at the near-end node, select **Configuration** → **Equipment** to access the Main 1 and 2 ports and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

Important! The port Application parameter may be changed from 1+1 to 1+1 Bidirectional or from 1+1 Bidirectional to 1+1 when cross-connections exist on the line pair.

2 Select **View** → **Equipment** to access the Main 1 and 2 ports and verify that the ports were provisioned correctly.

3 From the System View menu, select **Configuration** → **Equipment**. Select the system (AID=system), then click **Select** at the bottom of the window.

If required, provision the *1+1 Protection Priority* (unidirectional 1+1 applications only) and *Wait To Rename* (Optimized 1+1 applications only) parameters. Click **Apply** if changes were made, then click **Yes** to the warning message to make your changes. Click **Close** to exit.

4 **Important!** The protection group *Revertive Mode* and *Wait to Restore* parameters apply to unidirectional 1+1 applications and Bidirectional 1+1 applications only.

If the *Revertive Mode* parameter is disabled, the *Wait to Restore* parameter is not provisionable.

If required, from the System View menu,

1. Select **Configuration** → **Equipment**.
2. Select the **Ptn Grp** tab.
3. Click on the required 1+1 protection group and **Select**.
4. Provision the required protection group parameters according to the work instructions, then click **Apply** and **Close**. If no changes were made, click **Close** and go to the next step.

5 If required, from the System View menu,

1. Select **View** → **Protection**.
2. Select the required 1+1 protection group and click **Select**.
3. Verify that the protection group parameters were provisioned correctly. Then click **Close**.

6 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for DCC port *dcc-m-{1-8}* according to the work instructions.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

7 From the System View menu, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly, and click **Close**.

8 **Important!** Synchronization Autoreconfiguration is only provisionable if the system Timing Mode parameter is *Line* and the Sync Messaging parameter of all ports is *enabled*. If the Sync Messaging parameter is enabled at any port in the network, it must be enabled at all ports in the network.

If required, provision synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

9 **Important!** If Remote NE Status is to be used, at least one network element must be provisioned as the Alarm Gateway Network Element (AGNE) in the network. If the network element is designated as the Alarm Gateway Network Element (AGNE), the Alarm Gateway parameter must be provisioned *Enabled*.

From the System View menu, select **Administration** → **Set NE**, provision the *Remote NE Status*, *Alarm Group*, and *Alarm Gateway* parameters according to the work instructions, and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

Reference: Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

10 At the far-end node, provision the required Function/Growth ports and DCC terminations according to the work instructions.

If the far-end node is an...	Then...
Alcatel-Lucent 1665 DMX,	Refer to Procedure 9-5: "Establish low-speed 1+1 linear optical extension" (p. 9-71) to provision the required Function/Growth ports and DCC terminations.
Alcatel-Lucent 1665 DMXtend,	Refer to the other product's documentation to provision the required Function/Growth ports and DCC terminations.

11 **Important!** The near-end circuit pack in the Main 1 slot must be connected to the far-end circuit pack in the Alcatel-Lucent 1665 DMX Function/Growth slot A1, B1, C1, D1, G1, or the Alcatel-Lucent 1665 DMXtend Function slot D1 or G1.

The near-end circuit pack in the Main 2 slot must be connected to the far-end circuit pack in the Alcatel-Lucent 1665 DMX Function/Growth slot A2, B2, C2, D2, G2, or the Alcatel-Lucent 1665 DMXtend Function slot D2 or G2.

Refer to the 1+1 linear worksheet at the end of this procedure when connecting fibers.

Connect the optical fibers and verify the integrity of the optical span being established.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

12 Perform end-to-end optical line test.

Reference:

- Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)
- Procedure 14-8: "Perform end-to-end optical line test on Function OLIUs" (p. 14-66)

13 At each node in the 1+1 linear network, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

14 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The 1+1 linear network is now ready for initial service to be established.

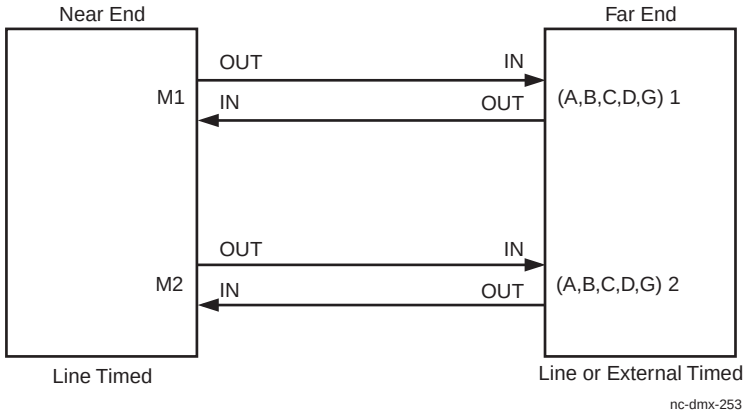
Reference:

- Chapter 10, "TDM service provisioning procedures"
- Chapter 11, "Ethernet/Data network provisioning procedures"

END OF STEPS

1+1 Linear Worksheet (Main-to-Function/Growth)

Important! A, B, C, D, and G (Growth) are valid Function slot pairs for Alcatel-Lucent 1665 DMX. D and G (Growth) are valid Function slot pairs for Alcatel-Lucent 1665 DMXtend.



TID= Protection Group AID _____	TID= Protection Group AID _____
M1 OUT Fiber Color/ID _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____	Port _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____ OUT Fiber Color/ID _____
M2 OUT Fiber Color/ID _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____	Port _____ IN Fiber Color/ID _____ Received Power Level _____ Required LBO _____ OUT Fiber Color/ID _____

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Procedure 9-1.5: Establish high-speed 0x1 unprotected optical extension

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3).

Steps

Important! This procedure assumes that the high-speed 0x1 unprotected optical extension is established by interconnecting a Very Large Fabric (VLF) LNW59, LNW82 OC-3/12/48/192, or LNW504 OC-48/OC-192 in the Main port at the Alcatel-Lucent 1665 DMX node to a far-end node. The Main slot pair of the Alcatel-Lucent 1665 DMX may be connected with the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48/192 Main slot pair or OC-3/12/48 Function/Growth slot pair. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1850 TSS-5 using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1850 TSS-5, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Operations Guide, 365-372-401*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMX using OC-3/12/48/192 Main slot pair or OC-3/12/48 Function/Growth slot pair. If connecting to the Function/Growth slot pair of another Alcatel-Lucent 1665 DMX, refer to Procedure 9-8: "Establish low-speed 0x1 unprotected optical extension" (p. 9-97), as required, when performing this procedure.

This procedure assumes that the Alcatel-Lucent 1665 DMX node has been equipped with the required circuit packs, software has been installed, and the node has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a high-speed 0x1 optical extension.

1 **Important!** The port Application parameter must be provisioned *0x1* .

From the System View menu at the Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment** to access the required Main port and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 Select **View** → **Equipment** to access the Main port provisioned in Step 1 and verify that the port was provisioned correctly.

3 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for required DCC port according to the work instructions.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

4 From the System View menu, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly for required DCC port and click **Close**.

5 **Important!** Synchronization Autoreconfiguration is only provisionable if the system Timing Mode parameter is *Line* and the Sync Messaging parameter of all ports is *enabled*. If the Sync Messaging parameter is enabled at any port in the network, it must be enabled at all ports in the network.

If required, provision synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 **Important!** If Remote NE Status is to be used, at least one network element must be provisioned as the Alarm Gateway Network Element (AGNE) in the network. If the network element is designated as the Alarm Gateway Network Element (AGNE), the Alarm Gateway parameter must be provisioned *Enabled*.

From the System View menu, select **Administration** → **Set NE**, provision the *Remote NE Status*, *Alarm Group*, and *Alarm Gateway* parameters according to the work instructions, and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

Reference: Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

7 At the far-end node that is connecting to the Alcatel-Lucent 1665 DMX node, provision the required port, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

Refer to the other product's documentation to perform the required provisioning.

8 Connect the optical fibers and verify the integrity of the optical span being established.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

9 Perform end-to-end optical line test.

Reference: Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)

10 Click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

11 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The 0x1 unprotected optical extension is now ready for initial service to be established.

Reference:

- Chapter 10, "TDM service provisioning procedures"
- Chapter 11, "Ethernet/Data network provisioning procedures"

END OF STEPS

Procedure 9-2: Add new Alcatel-Lucent 1665 DMX node to network

Overview

Use this procedure to add a new Alcatel-Lucent 1665 DMX node to a unidirectional path switched ring (UPSR)/bidirectional line switched ring (BLSR) using the following:

- OC-3/12/48 UPSR (Main slot pair or a Function/Growth slot pair)
- OC-48 BLSR (Main slot pair or a Function/Growth slot pair)
- OC-192 UPSR/BLSR (Main slot pair only).

Important! This procedure assumes that the new Alcatel-Lucent 1665 DMX shelf has been equipped with the required circuit packs/pluggable transmission modules, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 9-2), the following equipment is also required at the new Alcatel-Lucent 1665 DMX node and the two adjacent network elements:

- Optical power meter
- Note pad
- Technicians at each network element must be able to communicate with each other.

Important! All nodes in the existing network must have the same software release before adding a new node.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the following for the new node:
   - System-level parameter settings (for example, TID, alarm gateway function, and alarm group)
   - Automatic ring discovery parameter settings (BLSRs only)

- System synchronization parameter settings
- Port AIDs and parameter settings
- DCC port AIDs and parameter settings
- Nodes that are to be adjacent to the new node

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to add a new Alcatel-Lucent 1665 DMX node to a network.

1 To verify that no alarms are present at the new node, click **Alarm List** in the top right corner of the System View.

To verify that no loopbacks, protection switch lockouts, or protection switches are present at the new node, from the System View menu, select **View** → **Rolling Events**. Under the line beginning with **RTRV-COND-ALL**, any loopbacks, protection switch lockouts, or protection switches are displayed. Click **Close**.

Important! If the Alcatel-Lucent 1665 DMX fails to respond in the indicated manner, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.

2 Notify maintenance center that alarms will be generated.

3 **Important!** Two or more shelves in the same network cannot have the same TID.

Determine from either the Network Operations Center (NOC) or work instructions, all the other nodes in the existing ring. Verify that no duplicate TID settings exist between the ring and the new node. If duplicate TID settings exist, determine new settings and at each of the sites with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: “Set/change system TID” (p. 7-36)

4 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the new node to be compatible with the network.

Reference: Procedure 7-13: "Provision network layer 3 parameters" (p. 7-39)

5 To designate the alarm gateway function and alarm group numbers, select **Administration** → **Set NE** from the System View at the new node. If required, provision the *Remote NE Status*, *Alarm Group*, and *Alarm Gateway* parameters according to the work instructions.

Reference: Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26)

6 At the adjacent nodes, verify and record the DCC termination settings using the **View** → **DCC Terminations** command.

7

If adding a new node (shelf) to a...	Then...
UPSR,	Proceed to Procedure 9-2.1: "Add new Alcatel-Lucent 1665 DMX node to UPSR" (p. 9-36).
BLSR,	Proceed to Procedure 9-2.2: "Add new Alcatel-Lucent 1665 DMX node to BLSR" (p. 9-42).

END OF STEPS

Procedure 9-2.1: Add new Alcatel-Lucent 1665 DMX node to UPSR

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-2: "Add new Alcatel-Lucent 1665 DMX node to network" (p. 9-33).

Steps

Important! This procedure assumes that the new Alcatel-Lucent 1665 DMX shelf has been equipped with the required circuit packs/pluggable transmission modules, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

A new Alcatel-Lucent 1665 DMX node may be added to a unidirectional path switched ring (UPSR) using the following:

- OC-3/12/48 UPSR (Main slot pair or a Function/Growth slot pair)
- OC-192 UPSR (Main slot pair only).

Complete the following steps to add a new Alcatel-Lucent 1665 DMX node to an existing UPSR.

1 **Important!** For UPSR applications, the port Application parameter must be provisioned *UPSR*.

From the System View menu at the new node, select **Configuration** → **Equipment** to access the Main 1 and 2 ports and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

2 Select **View** → **Equipment** to access the Main 1 and 2 ports and verify that the ports were provisioned correctly.

3 **Important!** The LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu at the new node,

1. Select **Configuration** → **DCC Terminations**
2. Select the required DCC Port *dcc-m1-1* or *dcc-{a,b,c,d,g}1-{n}*, and provision the DCC terminations according to the work instructions.

3. Click **Apply** to make changes.
4. Select the required DCC Port *dcc-m2-1* or *dcc-{a,b,c,d,g}2-{n}*, and provision the DCC terminations according to the work instructions.
5. Click **Apply** to make changes.
6. Click **Close**.

   Result: The system reports `inconsistent DCC values` and `section DCC channel failed` alarms. These alarms clear when the new node is connected to UPSR.

   Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

4 From the System View menu at the new node, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly and click **Close**.

5 If the new node is added to the UPSR using the Main OLIU circuit packs, determine from either the Network Operations Center (NOC) or the work instructions the required synchronization for the new node. If required, select **Configuration** → **Timing/Sync** and provision the synchronization parameters according to the work instructions or office records.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

6



NOTICE

Service-disruption hazard

If pass-through cross-connections are not provisioned service interruptions can occur.

Pass-through cross-connections must be provisioned to support existing traffic on the ring through the new node.

Determine from either the Network Operations Center (NOC) or work instructions all the other nodes in the existing ring. Verify through the NOC all cross-connections that exist on the UPSR ports to which the new node will be connected. Also, note the cross-connection rate (for example, STS1, STS3C). These will be pass-through cross-connections at the new node. Enter the required pass-through cross-connections into the new node by selecting **Configuration** → **Cross-Connections** → **Create a New Cross-Connection**.

Important! It may be helpful to make a sketch of the network to visualize the cross-connections required.

7 **Important!** Refer to the example in Figure 9-1, "Adding a node example" (p. 9-39) when performing this step. The example assumes that the UPSR network is established using the *Main* slot pairs of Alcatel-Lucent 1665 DMX nodes. However, the Main/Function/Growth slots pairs at an Alcatel-Lucent 1665 DMX may also be connected in a UPSR with another Alcatel-Lucent 1665 DMX (Function/Growth slot pair), a Alcatel-Lucent 1665 DMXtend (Main/Function/Growth slot pair), a Alcatel-Lucent 1850 TSS-5 (Main slot pair), and/or a Alcatel-Lucent 1665 DMXplore (Main slot pair).

At each node in the UPSR, select **Reports** → **Path Protection List** to verify that no *Forced* or *Lockout* path protection switches exist.

If required, clear any existing *Forced* or *Lockout* path protection switches using the **Fault** → **Protection Switch** → **Path Protection** → **Switch Type Clear** command. (Refer to Figure 9-1, "Adding a node example" (p. 9-39) Figure A.)

8 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Using the work instructions, identify the nodes adjacent to the new node and ensure that you remove only the fiber connections for the optical span being discontinued.

Important! When the optical fibers are disconnected, the system performs automatic protection switches and subsequent transmission hits (less than 60 ms) will occur.

Perform the following: (Refer to Figure 9-1, "Adding a node example" (p. 9-39) Figure B for example.)

- At the West adjacent node (NE1), disconnect the optical fibers connected to the East adjacent node (NE2).
- At the East adjacent node (NE2), disconnect the optical fibers connected to the West adjacent node (NE1).

Result: Automatic path protection switching may occur at nodes in the ring. Transmission hits (less than 60 ms) occur as active traffic switches.

Figure 9-1 Adding a node example

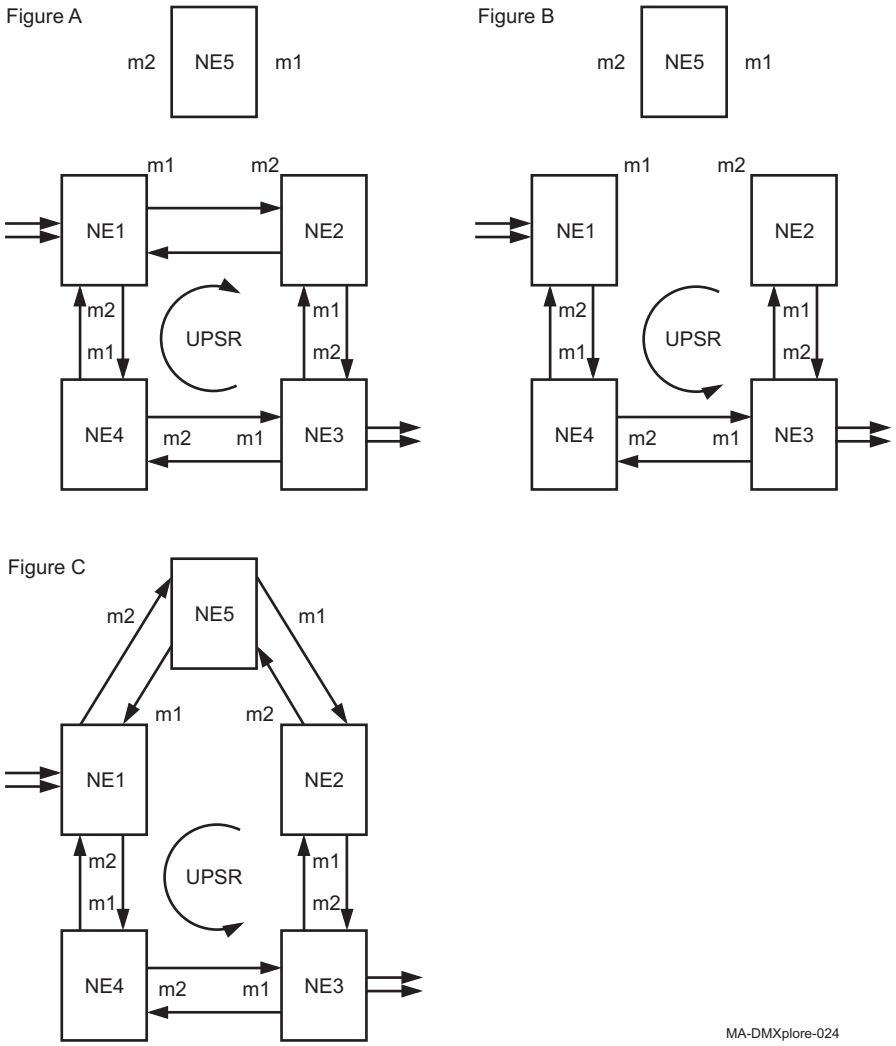


Figure A shows the new node (NE5) to be added to the UPSR.

Figure B shows the UPSR after path switches are performed on designated paths and fibers are disconnected between the West and East adjacent nodes (NE1 and NE2).

Figure C shows the new node (NE5) connected to the UPSR.

9 Perform the following: (Refer to Figure 9-1, "Adding a node example" (p. 9-39) Figure C for example.)

- At the West adjacent node (NE1), New node (NE5), and East adjacent node (NE2), connect all transmit fibers.
- At the West adjacent node (NE1), New node (NE5), and East adjacent node (NE2), measure the optical power level in the receive direction and attenuate if necessary.
- At the West adjacent node (NE1), New node (NE5), and East adjacent node (NE2), connect all receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

10 From the System View menu at the new node, select **Administration** → **OSI Neighbor Map** and verify that the new node is connected to the required adjacent nodes.

Important! If the report indicates wrong (or no) fiber connections and DCC-related alarms are reported, select **View** → **DCC Terminations** to obtain the *View DCC Termination* report and verify that the DCC terminations are provisioned correctly. If required, check fiber integrity and verify the node NSAP address is correct using the **Administration** → **View NE Administration** command.

11 If required at the new node, select **View** → **Timing/Sync** and verify the operational synchronization mode of the new node.

If the **Timing Mode** is holdover, check that the incoming timing references are connected. Also check **Mode Switching** (NA, revertive, or nonrevertive). If timing inputs are used, click the **Timing Input Ports** tab and check the **Input and Output Format**.

12 At the new node and the adjacent nodes, click the **Alarm List** button and verify that no alarms are present.

Important! If `inc. VT AIS`, `inc. VT unequipped`, `inc. STSN AIS`, `inc. STSN unequipped` alarm is present with no `inc. OCn LOS` alarm at the nodes adjacent to the new node, check that all pass-through cross-connections at the new node have been properly made. From the System View menu, select **View** → **Cross-Connections**.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

13 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The new node is now ready for initial service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Procedure 9-2.2: Add new Alcatel-Lucent 1665 DMX node to BLSR

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-2: "Add new Alcatel-Lucent 1665 DMX node to network" (p. 9-33).

Steps

Important! This procedure assumes that the new Alcatel-Lucent 1665 DMX shelf has been equipped with the required circuit packs, software has been installed, and the shelf has passed the looped transmission tests. If not, refer to Chapter 5, "Node turnup procedures".

A new Alcatel-Lucent 1665 DMX node may be added to a bidirectional line switched ring (BLSR) using the following:

- OC-48 BLSR (Main slot pair or a Function/Growth slot pair)
- OC-192 BLSR (Main slot pair only).

A BLSR supports up to 16 nodes.

Complete the following steps to add a new Alcatel-Lucent 1665 DMX node to an OC-48/192 BLSR.

1 From the System View menu at a node in the OC-48/192 BLSR,

1. Select **View** → **Protection**.
2. Select the required *2F BLSR* protection group and click **Select**.
3. Click on the *Provisionable Parameters* tab and observe the provisioned value of the Automatic Ring Discovery parameter. Determine whether Automatic Ring Discovery is enabled or disabled and click **Close**.

2 **Important!** For BLSR applications, the port Application parameter must be provisioned *2F BLSR*.

Up to 15 BLSR protection groups may be supported by a single network element when the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

From the System View menu at the new node, select **Configuration** → **Equipment** to access the required ports and provision the port parameters according to the work instructions.

Result: The system reports a default K-bytes alarm.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

3 Select **View** → **Equipment** to access the required ports and verify that the ports were provisioned correctly.

4 From the system view at the new node,

1. Select **Configuration** → **Equipment**.
2. Select the **Ring ID** tab and expand the required ring by clicking on the plus sign (+).
3. Select the required *2F BLSR* protection group and click **Select**.
4. Provision the required protection group parameters according to the work instructions, then click **Apply** to make the changes.
5. Click **Close**.

5 From the System View menu at the new node,

1. Select **View** → **Protection**.
2. Select the required *2F BLSR* protection group and click **Select**.
3. Click on the *Provisionable Parameters* tab and verify that the protection group parameters were provisioned correctly. Then click **Close**.

6 **Important!** The LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu at the new node,

1. Select **Configuration** → **DCC Terminations**.
2. Select the required DCC Port *dcc-m1-1* or *dcc-{a,b,c,d,g}1-{n}*, and provision the DCC terminations according to the work instructions.
3. Click **Apply** to make changes.
4. Select the required DCC Port *dcc-m2-1* or *dcc-{a,b,c,d,g}2-{n}*, and provision the DCC terminations according to the work instructions.
5. Click **Apply** to make changes.
6. Click **Close**.

Result: The system reports `inconsistent DCC values` and `section DCC channel failed` alarms. These alarms clear when the new node is connected to BLSR.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

7 From the System View menu at the new node, select **View** → **DCC Terminations**, verify that the DCC terminations were provisioned correctly and click **Close**.

8 If the new node is added to the BLSR using the Main OLIU circuit packs, determine from either the Network Operations Center (NOC) or the work instructions the synchronization for the new node. If required, select **Configuration** → **Timing/Sync** and provision the synchronization parameters according to the work instructions or office records.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

9 Determine from either the Network Operations Center (NOC) or the work instructions all the other nodes in the existing ring. Verify through the NOC all existing cross-connections that exist on the adjacent nodes to where the new node will be located. Also, note the source or destination, cross-connection type (for example, 2F BLSR add/drop, 1-way), and cross-connection rate (for example, STS1, STS3c). These will be pass-through cross-connections at the new node.

Important! It may be helpful to make a sketch of the network to visualize the required pass-through cross-connections at the new node.

To verify the cross-connections, at the adjacent West node select **View** → **Cross-Connections**. On the left side of the screen, select the required circuit pack and click **Select**. Record the *Src* (source tributary AID), *Src NE Name* (source network element name) *Type*, *Rate*, *Dest* (destination tributary AID), *Dest NE Name* (destination network element name), and *CKT ID* (circuit ID) of the cross-connections that result in traffic directly to and/or from the other adjacent node. These will be pass-through cross-connections at the new node.

10

If...	Then...
automatic ring discovery (Release 3.0 and later releases) is enabled at the new node,	At the new node, select **View** → **Protection** to access the required 2F BLSR protection group and verify that the Auto Squelch Map parameter is Auto. If required, select **Configuration** → **Equipment** to access the required 2F BLSR protection group and provision the Auto Squelch Map to Auto. Continue with the next step.
manual ring discovery (Release 2.1) is enabled at the new node,	**Important!** The manual ring map must be updated manually at each node in the ring. Perform the following: 1. At the new node, edit and activate the manual ring map. 2. At the existing nodes, edit the manual ring map to add the new node, but do *NOT* activate the updated manual ring maps. 3. Continue with the next step. Procedure 9-4: "Provision manual ring map" (p. 9-65)

11



NOTICE

Service-disruption hazard

If VT1.5/STS-N pass-through cross-connections are not provisioned at the new node, service interruptions can occur.

Pass-through cross-connections must be provisioned to support existing traffic on the ring through the new node.

At the new node, enter the required VT1.5/STS-N pass-through cross-connections (based on the cross-connection information retrieved in Step 9) by selecting **Configuration** → **Cross-Connections** → **Create a New Cross-Connection**.

12 At each node in the BLSR, verify that no BLSR protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any protection switches are displayed.

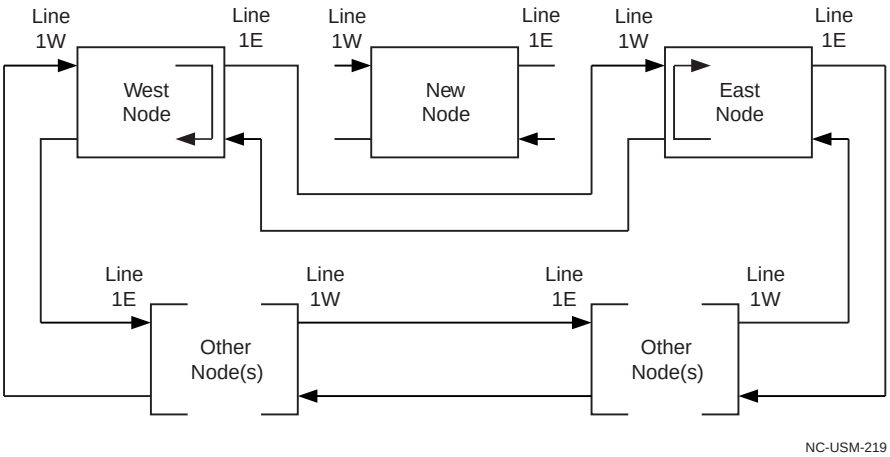
Remove all BLSR protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Alarm Messages and Trouble Clearing Guide, 365-372-402*

13 **Important!** The Force to Protection, Ring switch may cause transmission hits (less than 60 ms).

Perform the following: (Refer to the following figure.)

- At the West Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group (according to the work instructions) and perform a protection switch in the **East** direction with switch type **Force to Protection, Ring**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch completes, click **Close**.
- At the East Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group (according to the work instructions) and perform a protection switch in the **West** direction with switch type **Force to Protection, Ring**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch completes, click **Close**.



Legend:

Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

14

NOTICE

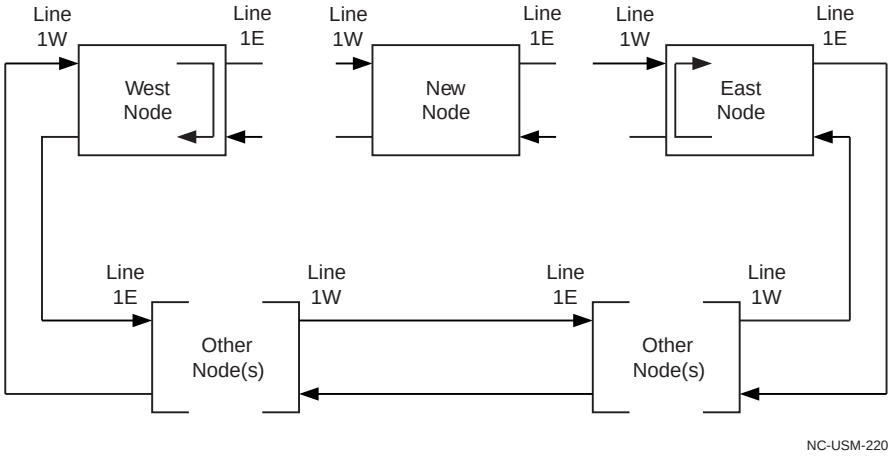
Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being discontinued.

Perform the following: (Refer to the following figure.)

- At the West Node, disconnect the optical fibers connected to the East Node.
- At the East Node, disconnect the optical fibers connected to the West Node.



Legend:

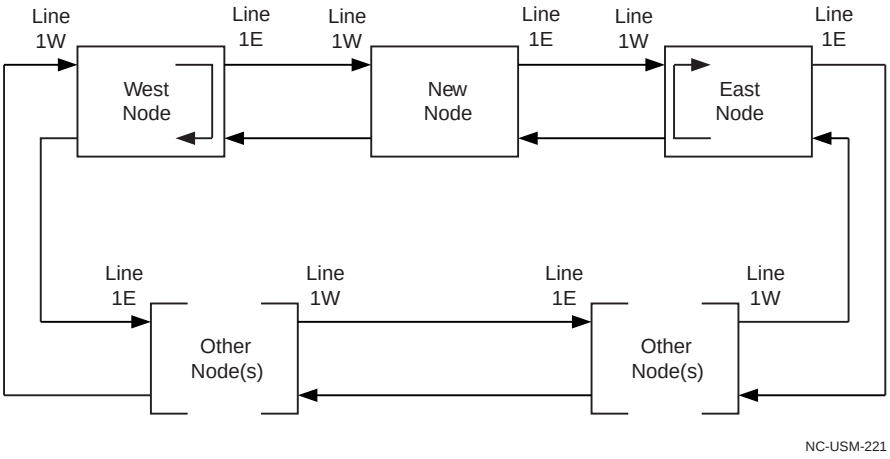
Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

15 Perform the following: (Refer to the following figure.)

- At the West, New, and East nodes, connect all transmit fibers.
- At the West, New, and East nodes, measure the optical power level in the receive direction and attenuate if necessary.
- At the West, New, and East nodes, connect all receive fiber.

Refer to Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47).



Legend:

Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

16 **Important!** As the ring is connected, nodes automatically communicate with each other using the data communications channel (DCC) and build a ring map. If successful, automatic ring discovery builds a ring map at each node and the `Ring Discovery in Progress` condition clears. If unsuccessful, the ring map is not complete and alarms are reported.

If automatic ring discovery is enabled, wait until the `Ring Discovery in Progress` condition clears.

If other alarms/conditions are reported, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* and clear the alarms/conditions.

17 From the System View menu at the new node, select **Administration** → **OSI Neighbor Map** and verify that the new node is connected to the required adjacent nodes.

Important! If the report indicates wrong (or no) fiber connections and DCC-related alarms are reported, select **View** → **DCC Terminations** to obtain the *View DCC Termination* report and verify that the DCC terminations are provisioned correctly. If required, check fiber integrity and verify the node NSAP address is correct using the **Administration** → **View NE Administration** command.

18 If required at the new node, select **View** → **Timing/Sync** and verify the operational synchronization mode of the new node.

If the **Timing Mode** is holdover, check that the incoming timing references are connected. Also check **Mode Switching** (NA, revertive, or nonrevertive). If timing inputs are used, click the **Timing Input Ports** tab and check the **Input and Output Format**.

19 If Automatic Ring Discovery is disabled (that is, manual ring discovery), activate the manual ring maps at the existing nodes in the network. Otherwise, continue with the next step.

Select **Configuration** → **Activate Manual Ring Map**. Select the required Ring ID and click **Select**.

Result: A dialog box appears asking you to confirm activating the manual ring map. Click **OK**. The inactive manual ring map is now activated.

20 If the work instructions specify that the Auto Squelch Map parameter should be Manual at the new node, select **Configuration** → **Equipment** to access the required 2F BLSR protection group and provision the Auto Squelch Map parameter to Manual.

21 Perform the following:

- At the West Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group and clear the protection switch in the **East** direction with switch type **Clear**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch clears, click **Close**.
- At the East Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group and clear the protection switch in the **West** direction with switch type **Clear**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch clears, click **Close**.

Important! The Clear switch may cause transmission hits (less than 60 ms). Wait for alarms to clear.

22 From the System View menu at the East and West nodes,

1. Select **View** → **Protection**.
2. Select the required *2F BLSR* protection group and click **Select**.
3. Observe the Ring Node APS (Automatic Protection Switch) State, East Switch Request State, West Switch Request State, East Channel State, and West Channel State parameters. Verify that the protection switches have cleared and click **Close**.

23 At the new node and the adjacent nodes, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

24 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The new node is now ready for initial service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Procedure 9-3: Discontinue Alcatel-Lucent 1665 DMX node from network

Overview

Use this procedure to discontinue a Alcatel-Lucent 1665 DMX node from a unidirectional path switched ring (UPSR) or bidirectional line switched ring (BLSR).

The Alcatel-Lucent 1665 DMX node may interface with a UPSR/BLSR using the OLIU circuit packs in the Main slot pair or a Function/Growth slot pair.

Important! All nodes in the existing network must have the same software release before removing a node.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to discontinue a Alcatel-Lucent 1665 DMX node from a UPSR or BLSR.

1 To verify that no alarms are present, click the **Alarm List** button at each node. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 **Important!** To retrieve a map of the SONET network, select **Administration** → **OSI Routing Map** and **Administration** → **OSI Neighbor Map**. To retrieve a map of the BLSR select **View** → **Rings** → **Ring Map**.

Determine which Alcatel-Lucent 1665 DMX node is being discontinued.

3 Verify that the optical loss budget will not be exceeded by removing this node. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs.)

4 Verify the system timing at each node using the **View** → **Timing/Sync** command. If required, reconfigure the timing of the network using the **Configuration** → **Timing/Sync** command.

Important! Reconfiguring network timing may cause nodes to temporarily go into the holdover timing mode.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

5 

NOTICE

Service-disruption hazard

Discontinuing a node with active add/drop traffic will result in a service interruption.

Ensure that ALL service to/from the UPSR/BLSR is removed from the node before continuing.

At the node being discontinued, verify that all service to/from the UPSR/BLSR has been removed. From the System View menu, select **View** → **Cross-Connections** to verify that there are no add/drop cross-connections to the UPSR/BLSR. If required, delete any existing add/drop cross-connections to the UPSR/BLSR using **Configuration** → **Cross-Connections**.

6 If the node being discontinued is an AGNE, establish another node in the network as an AGNE (if required). If required, disable the AGNE at the node being discontinued.

Important! At the new AGNE, the Remote NE Status parameter must be enabled prior to designating the AGNE(s).

Reference: Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26)

7 If the node being discontinued is the gateway host node, establish another gateway host node with an IP address for the network element and the required IP addresses in the gateway host file.

Reference: Procedure 7-16: “Provision/enable/disable the NE as a TL1 TCP/IP GNE” (p. 7-46)

8

If discontinuing a node from a...	Then...
UPSR,	Proceed to Procedure 9-3.1: “Discontinue Alcatel-Lucent 1665 DMX node from UPSR” (p. 9-54).
BLSR,	Proceed to Procedure 9-3.2: “Discontinue Alcatel-Lucent 1665 DMX node from BLSR” (p. 9-58).

END OF STEPS

Procedure 9-3.1: Discontinue Alcatel-Lucent 1665 DMX node from UPSR

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-3: "Discontinue Alcatel-Lucent 1665 DMX node from network" (p. 9-51).

Steps

Important! The Alcatel-Lucent 1665 DMX node may be using the OLIU circuit packs in the Main slot pair or a Function/Growth slot pair to interface with a UPSR.

Complete the following steps to discontinue a Alcatel-Lucent 1665 DMX node from a UPSR.

1 **Important!** Refer to the example in Figure 9-2, "Discontinuing a node example" (p. 9-55) when performing this step. The example assumes that the UPSR network is established using the *Main* slot pairs of Alcatel-Lucent 1665 DMX nodes. However, the Main/Function/Growth slots pairs at an Alcatel-Lucent 1665 DMX may also be connected in a UPSR with another Alcatel-Lucent 1665 DMX (Function/Growth slot pair), a Alcatel-Lucent 1665 DMXtend (Main/Function/Growth slot pair) a Alcatel-Lucent 1850 TSS-5 (Main slot pair), and/or a Alcatel-Lucent 1665 DMXplore (Main slot pair).

At each node in the UPSR, select **Reports** → **Path Protection List** to verify that no *Forced* or *Lockout* path protection switches exist.

If required, clear any existing *Forced* or *Lockout* path protection switches using the **Fault** → **Protection Switch** → **Path Protection** → **Switch Type Clear** command. (See example in Figure 9-2, "Discontinuing a node example" (p. 9-55) Figure A.)

2 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being discontinued.

Important! When the optical fibers are disconnected, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur.

Remove the optical fiber from NE1 M1 transmit to NE5 M2 receive and the optical fiber from NE5 M1 transmit to NE2 M2 receive (only) (Figure 9-2, “Discontinuing a node example” (p. 9-55) Figure A). These optical fibers are associated with Ring (Path) 2.

Result: Automatic path protection switching will occur. Ring (Path) 1 is active.

Figure 9-2 Discontinuing a node example

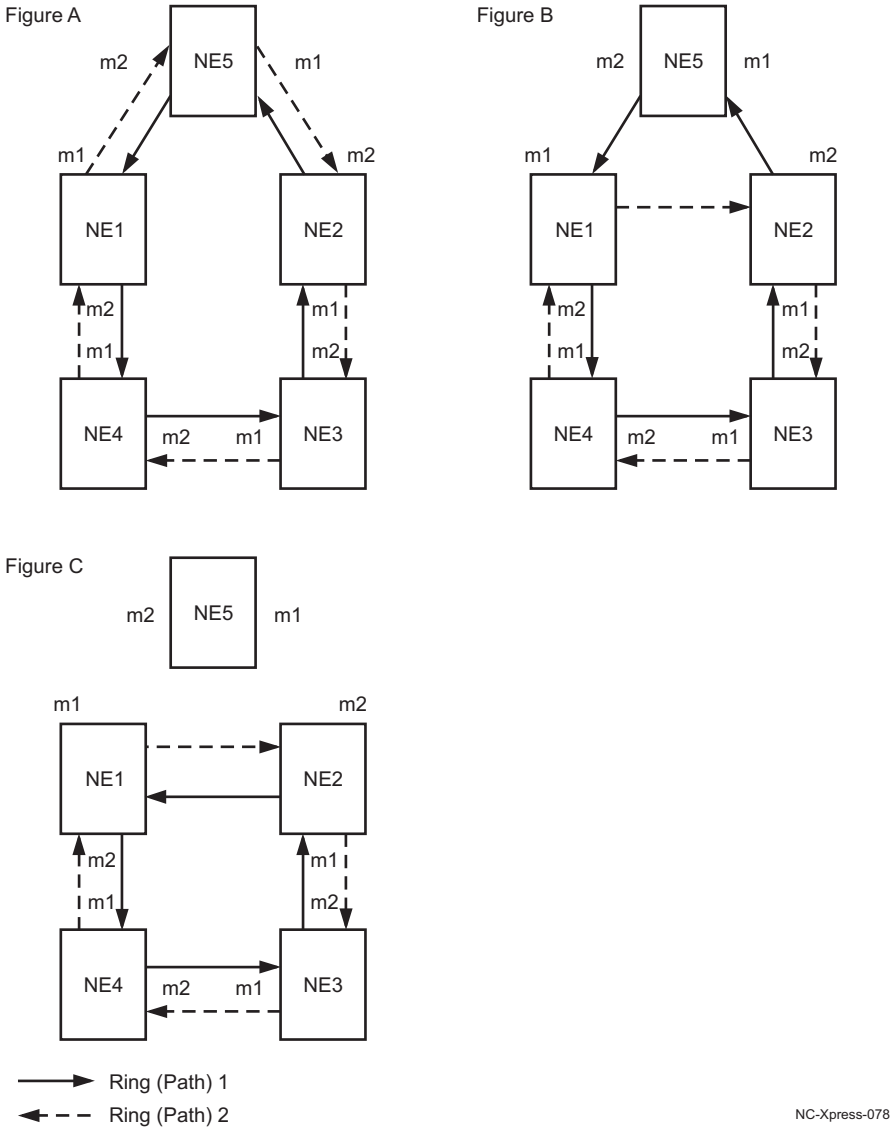


Figure A shows the node to be discontinued (NE5) from the UPSR.

Figure B shows the removal of the optical fibers associated with Ring (Path) 2 and the connection of optical fiber associated with Ring (Path) 2 fiber from NE1 to NE2.

Figure C shows the removal of the optical fibers associated with Ring (Path) 1 and the connection of optical fiber associated with Ring (Path) 1 fiber from NE2 to NE1.

3 Connect the fiber to NE1 M1 transmit (Figure 9-2, “Discontinuing a node example” (p. 9-55)B). At NE2 M2 receive, measure the optical power level in the receive direction, attenuate if necessary, and connect the fiber.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

4 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being discontinued.

Important! When the optical fibers are disconnected, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur.

Remove the optical fiber from NE2 M2 transmit to NE5 M1 receive and the optical fiber from NE5 M2 transmit to NE1 M1 receive. (Figure 9-2, “Discontinuing a node example” (p. 9-55) Figure B).

Result: Automatic path protection switching will occur.

5 Connect the fiber to NE2 M2 transmit (Figure 9-2, “Discontinuing a node example” (p. 9-55) Figure C). At NE1 M1 receive, measure the optical power level in the receive direction, attenuate if necessary, and connect the fiber.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

6 To verify that no alarms are present in the network, click the **Alarm List** button at each node. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

7 Is the removed shelf to be powered down?

If...	Then...
Yes	Power down the shelf per local procedures and remove circuit packs (if required), then proceed to Step 12.
No	Continue with Step 8.

8 If required to prevent alarms, provision the system Timing Mode parameter as *Free Running* using **Configuration** → **Timing/Sync**.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

9 If the shelf is being removed from service, select **View** → **Cross-Connections** to verify that there are no cross-connections on the shelf. If required, delete any existing cross-connections using **Configuration** → **Cross-Connections**.

10 Update the internal equipment list by either pressing the **UPD/INIT** push-button on the SYSCTL circuit pack or using **Configuration** → **Update System** → **Update All**.

11 To verify that no alarms are present, click the **Alarm List** button. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

12 The Alcatel-Lucent 1665 DMX node is now removed from the unidirectional path switched ring (UPSR).

END OF STEPS

Procedure 9-3.2: Discontinue Alcatel-Lucent 1665 DMX node from BLSR

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-3: "Discontinue Alcatel-Lucent 1665 DMX node from network" (p. 9-51).

Steps

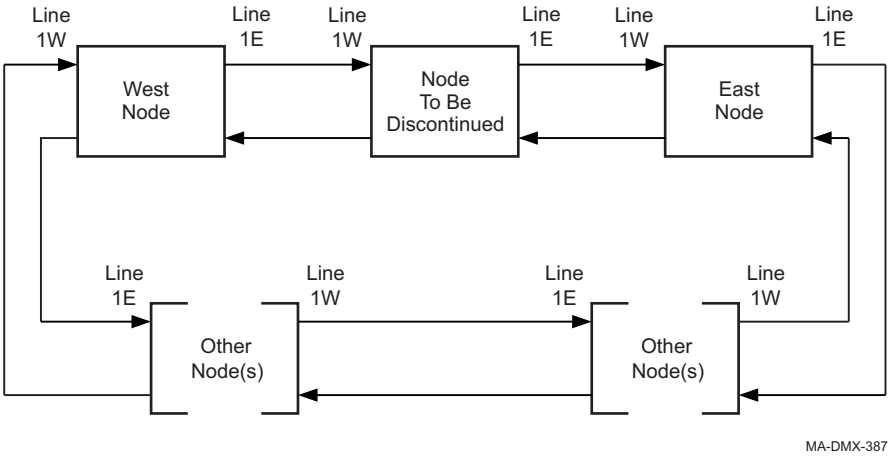
Important! Verify that the work instructions specify whether automatic ring discovery is enabled or disabled on the existing ring.

The Alcatel-Lucent 1665 DMX node (shelf) may be using the OLIU circuit packs in the Main slot pair or a Function/Growth slot pair to interface with a BLSR.

Complete the following steps to discontinue an Alcatel-Lucent 1665 DMX node from a BLSR.

1 **Important!** The example assumes that the BLSR network is established using the *Main* slot pairs of Alcatel-Lucent 1665 DMX nodes. However, a Function/Growth slots pair may also be used to interface with an OC-48 BLSR.

Identify the node to be discontinued, the adjacent West node, and the adjacent East node. (Refer to the following figure.)



Legend:

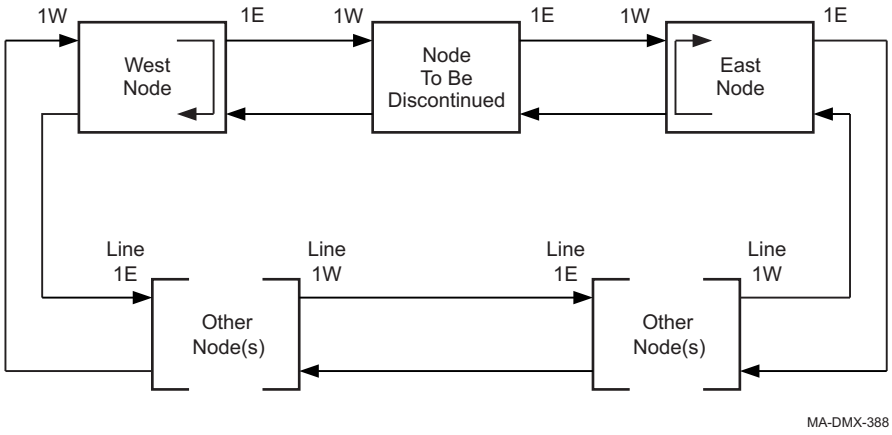
Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

2 **Important!** The Force to Protection, Ring switch may cause transmission hits (less than 60 ms).

Perform the following: (Refer to the following figure.)

- At the West Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group (according to the work instructions) and perform a protection switch in the **East** direction with switch type **Force to Protection, Ring**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch completes, click **Close**.
- At the East Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group (according to the work instructions) and perform a protection switch in the **West** direction with switch type **Force to Protection, Ring**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch completes, click **Close**.



Legend:

Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

3

NOTICE

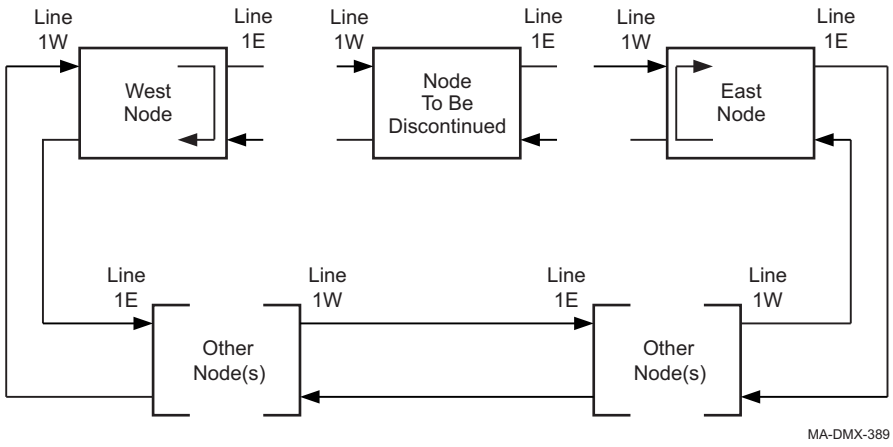
Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being discontinued.

Perform the following: (Refer to the following figure.)

- At the adjacent West Node, disconnect the optical fibers connected to the node to be discontinued.
- At the node to be discontinued, disconnect the optical fibers connected to the adjacent East Node and West Node.
- At the adjacent East Node disconnect the optical fibers connected to the node to be discontinued.



Legend:

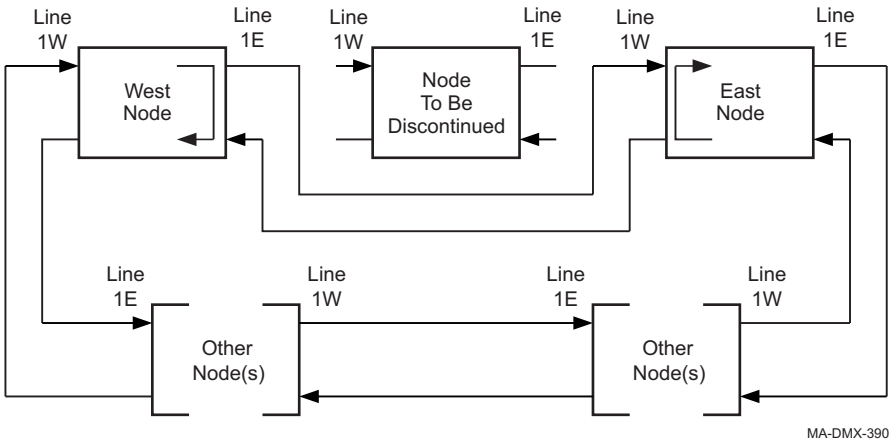
Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

4 Perform the following: (Refer to the following figure.)

- At the West and East nodes, connect the transmit fiber.
- At the West and East nodes, measure the optical power level in the receive direction and attenuate if necessary.
- At the West and East nodes, connect the receive fiber.

Refer to Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47).



Legend:

Line 1W: Line 1W (West port) is the port in slot 1 of the 2F BLSR protection group (for example, Main-1 or FN-A-1).

Line 1E: Line 1E (East port) is the port in slot 2 of the 2F BLSR protection group (for example, Main-2 or FN-A-2).

5

If automatic ring discovery is...	Then...
enabled,	**Important!** As the ring is connected, nodes automatically communicate with each other using the data communications channel (DCC) and build a ring map. If successful, automatic ring discovery builds a ring map at each node and the `Ring Discovery in Progress` condition clears. If unsuccessful, the ring map is not complete and alarms are reported. Perform the following: 1. Wait until the `Ring Discovery in Progress` condition clears. If other alarms/conditions are reported, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* and clear the alarms/conditions. 2. Proceed to Step 7.

If automatic ring discovery is...	Then...
disabled (manual ring discovery),	**Important!** The manual ring map must be updated manually at each node in the ring. At each of the remaining nodes in the ring, edit the manual ring map to remove the discontinued node, but do *NOT* activate the updated manual ring maps. Then continue with Step 6 Refer to Procedure 9-4: "Provision manual ring map" (p. 9-65).

6 If Automatic Ring Discovery is disabled at the remaining nodes in the ring, activate the manual ring maps.

Select **Configuration** → **Activate Manual Ring Map**. Select the required Ring ID and click **Select**.

Result: A dialog box appears asking you to confirm activating the manual ring map. Click **OK**. The inactive manual ring map is now activated.

7 Perform the following:

- At the West Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group (according to the work instructions) and clear the protection switch in the **East** direction with switch type **Clear**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch completes, click **Close**.
- At the East Node, from the System View menu select **Fault** → **Protection Switch**. Select the required *2F BLSR* protection group (according to the work instructions) and clear the protection switch in the **West** direction with switch type **Clear**. Click **Apply**. A dialog box appears asking you to confirm executing this command. Click **Yes**. After the protection switch completes, click **Close**.

  Important! The Clear switch may cause transmission hits (less than 60 ms). Wait for alarms to clear.

Result: The node to be discontinued is now removed from the ring.

8 From the System View menu at the East and West nodes,

1. Select **View** → **Protection**.
2. Select the required *2F BLSR* protection group and click **Select**.
3. Observe the Ring Node APS (Automatic Protection Switch) State, East Switch Request State, West Switch Request State, East Channel State, and West Channel State parameters. Verify that the protection switches have cleared and click **Close**.

9 To verify that no alarms are present in the network, click the **Alarm List** button at each node. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

10 Is the removed shelf to be powered down?

If...	Then...
Yes,	Power down the shelf per local procedures then proceed to Step 15.
No,	Continue with Step 11.

11 If required to prevent alarms, provision the system Timing Mode parameter as *Free Running* using **Configuration** → **Timing/Sync**.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

12 If the shelf is being removed from service, select **View** → **Cross-Connections** to verify that there are no cross-connections on the shelf. If required, remove any existing cross-connection using **Configuration** → **Cross-Connections**.

13 Update the internal equipment list by either pressing the **UPD/INIT** push-button on the SYSCTL circuit pack or using **Configuration** → **Update System** → **Update All**.

14 To verify that no alarms are present, click the **Alarm List** button. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 The Alcatel-Lucent 1665 DMX node is now removed from the bidirectional line switched ring (BLSR).

END OF STEPS

Procedure 9-4: Provision manual ring map

Overview

Use this procedure to perform the following at a node in a 2-fiber bidirectional line switched ring (BLSR):

- Establish a new manual ring map
- Add a node(s) to an existing manual ring map
- Delete a node(s) from an existing manual ring map.

  Important! If deleting a node(s) from an existing ring map, then the circuits that add/drop to the deleted node(s) must be deleted. Refer to Chapter 10, "TDM service provisioning procedures" and Chapter 11, "Ethernet/Data network provisioning procedures".

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the 2F BLSR protection group (port Application parameter must be provisioned *2F BLSR*), Ring ID, and node ID(s).

Steps

Complete the following steps to provision the manual ring map at a node(s) in a 2-fiber bidirectional line switched ring (BLSR).

1

If the network element is equipped with...	Then...
Release 3.0 or later software,	verify that Automatic Ring Discovery is disabled by selecting **View** → **Protection**. Click on the required *2F BLSR protection group*and **Select**. Then click on the Provisionable Parameters tab and observe the Automatic Ring Discovery parameter. Continue with Step 2.
Release 2.1 or earlier software,	Proceed to Step 3.

2 Is the Automatic Ring Discovery parameter *Enabled* or *Disabled*?

If Automatic Ring Discovery is...	Then...
Disabled,	Click **Close** and continue with Step 3.
Enabled,	Click **Close** and perform the following: 1. Select **Configuration** → **Equipment**. 2. Select the **Ptn Grp** tab and the required *2F BLSR* protection group. Then click **Select**. 3. Provision the Automatic Ring Discovery parameter to *Disabled*, then click **Apply** and **Close**.

3 Select **Configuration** → **Configure Manual Ring Map**.

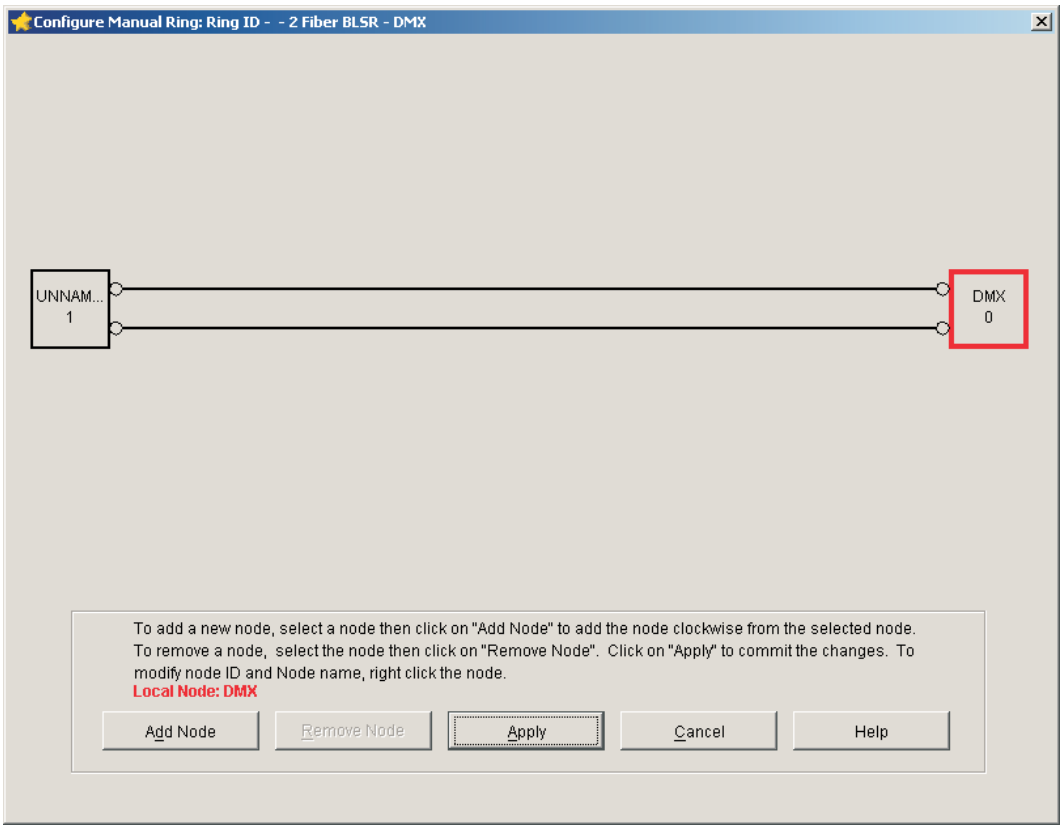
Result: The *Configure Manual Ring Map* window opens.

4

If...	Then...
Establishing a new manual ring map,	Continue with Step 5.
Adding a node(s) to an existing manual ring map,	Proceed to Step 10.
Deleting a node(s) from an existing manual ring map,	Proceed to Step 13.

5 Click on the required Ring ID and **Select**.

Result: A dialog box appears stating that there is no existing manual ring map, you will be configuring a new manual ring map. Click **OK**. The *Configure Manual Ring* window opens showing the local node and an unnamed node. (Refer to following figure.)



6 **Important!** The local node appears on the right side of the *Configure Manual Ring* screen. This shows the NE Name (DMX) and Node ID (0). The Node ID of the local node may need to be changed to comply with the work instructions.

If required, right click on the local node and change the *Node ID* according to the work instructions. Click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**, and the modified node information appears on the *Configure Manual Ring* screen.

7 **Important!** The *NE Name* and *Node ID* of the unnamed node must be modified to the NE Name and node ID of the node that is connected to the East port (for example, Main-2) of the Local node per the work instructions.

Right click on the unnamed node (*UNNAMED 1*) and change the *NE Name* and *Node ID* according to the work instructions. Click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**, and the modified node information appears on the *Configure Manual Ring* screen.

8 **Important!** In the manual ring map, nodes are added in the clockwise (East) direction only from the node that is selected.

To add another node, click on the required node and click **Add Node**. Enter the *NE Name* and *Node ID* of the next node in the East direction (clockwise) according to the work instructions. Click **OK**.

Result: A dialog box appears asking you to confirm adding a new node to the manual ring map. Click **Yes**, and the new node appears on the *Configure Manual Ring* screen.

9 Are additional nodes to be added?

If...	Then...
Yes,	**Important!** A maximum of 16 nodes can be added to the manual ring map. As required per the work instructions, repeat Step 8 to add additional nodes to the manual ring map. Then proceed to Step 16.
No,	Proceed to Step 16.

10 Click on the required Ring ID and **Select**.

Result: The *Configure Manual Ring* window opens.

11 **Important!** The local node appears at the top of the *Configure Manual Ring* screen. In the manual ring map, nodes are added in the clockwise (East) direction only from the node that is selected.

Select the required node and then click **Add Node**. Enter the *NE Name* and *Node ID* of the new node according to the work instructions. Click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**, and the new node appears on the *Configure Manual Ring* screen.

12 Are additional nodes to be added?

If...	Then...
Yes,	**Important!** A maximum of 16 nodes can be added to the manual ring map. As required per the work instructions, repeat Step 11 to add additional nodes to the manual ring map. Then proceed to Step 16.
No,	Proceed to Step 16.

13 Click on the required Ring ID and **Select**.

Result: The *Configure Manual Ring* window opens.

14 **Important!** The local node appears at the top of the *Configure Manual Ring* screen.

Click on the node to be deleted and then click **Remove Node**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the node is removed from the *Configure Manual Ring* screen.

15 Are additional nodes to be deleted?

If...	Then...
Yes,	As required per the work instructions, repeat Step 14 to delete additional nodes from the manual ring map. Then proceed to Step 16.
No,	Proceed to Step 16.

16 Click **Apply**.

17 Select **Configuration** → **Activate Manual Ring Map**.

Result: The *Activate Manual Ring Map* window opens.

18 Select the required Ring ID and click **Select**.

Result: A dialog box appears asking you to confirm activating the manual ring map. Click **OK**. The inactive manual ring map is now activated.

19 Select **View** → **Rings** → **Ring Map**. Select the required Ring ID and click **Select**. Verify that the manual ring map was provisioned correctly and click **Close**.

END OF STEPS

Procedure 9-5: Establish low-speed 1+1 linear optical extension

Overview

Use this procedure to establish a low-speed 1+1 linear OC-3/12/48 optical extension.

Important! This procedure assumes that the low-speed 1+1 optical linear extension is established by interconnecting a OC-3/12/48 Function/Growth slot pair at the host Alcatel-Lucent 1665 DMX to one of the following:

- Alcatel-Lucent 1665 DMX using OC-3/12/48 Main slot pair. Figure 9-3, "1+1 extension example 1" (p. 9-77) shows a Alcatel-Lucent 1665 DMX at Node 1 with low-speed OC-12/48 OLIUs in Function slot pair D1/D2 connected to Node 2 Main slot pair. If connecting to the Main slot pair of another Alcatel-Lucent 1665 DMX, refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3), as required, when performing this procedure.
- Alcatel-Lucent 1665 DMX using OC-3/12/48 Function/Growth slot pair. Figure 9-4, "1+1 extension example 2" (p. 9-78) shows a Alcatel-Lucent 1665 DMX at Node 6 with low-speed OC-3/12/48 OLIUs in Function slot pair D1/D2 connected to Node 5 low-speed D1/D2 Function slot pair.

The Function/Growth slot pair at the host Alcatel-Lucent 1665 DMX may also be connected to the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48 Main slot pair or an OC-3/12/48 Function/Growth slot pair. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMXplore using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXplore, refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*, as required, when performing this procedure.

Ignore all alarms until the procedure is complete.

Privilege level

You must log in as either a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Verify that you have the necessary work instructions detailing the slots, circuit packs, ports, and network element parameters to be used for this procedure.
4. Verify that the network containing the host Alcatel-Lucent 1665 DMX node is established and operating properly.
5. Verify that the far-end node being connected to the host Alcatel-Lucent 1665 DMX node has been equipped and is operating properly.

Steps

Complete the following steps to establish a low-speed 1+1 optical extension.

1 Determine the network configuration using the work instructions and office records. Refer to the examples in Figure 9-3, "1+1 extension example 1" (p. 9-77) and Figure 9-4, "1+1 extension example 2" (p. 9-78).

2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the host Alcatel-Lucent 1665 DMX and the far-end node. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX and the far-end node.

Reference: Procedure 7-13: "Provision network layer 3 parameters" (p. 7-39)

4 At the host Alcatel-Lucent 1665 DMX node, verify/install OLIU circuit packs and/or pluggable transmission modules in the Function Group slot pair (A, B, C, D, or G) being used for access according to the work instructions.

Important! If the work instructions or office records do not specify OLIU types, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs/pluggable transmission modules and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

The connections to the Alcatel-Lucent 1665 DMX shelf must be in two slots in the same Function/Growth group (for example: A1 and A2).

Reference:

- Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX node, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

6 **Important!** The port Application parameter must be provisioned *1+1* at both ends of the system, *Optimized 1+1* at both ends of the system, or *Bidirectional 1+1* at both ends of the system. *Bidirectional 1+1* is required when interworking with other vendor's equipment that does *not* bridge DCC traffic on the active and standby lines. (Alcatel-Lucent 1665 DMX supports bridging DCC traffic on the active and standby lines.)

Alcatel-Lucent 1665 DMXtend does not support *Optimized 1+1*.

Alcatel-Lucent 1665 DMXplore does not support *Optimized 1+1* or *Bidirectional 1+1*.

From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**. One at a time, select the required ports, and provision the required port parameters according to the work instructions.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

7 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**, if not already open. Select the system (AID=system), then click **Select** at the bottom of the window.

If required, provision the *1+1 Protection Priority* (1+1 applications only) and *Wait To Rename* (Optimized 1+1 applications only) parameters. Click **Apply** if changes were made, then click **Yes** to the warning message to make your changes. Click **Close** to exit.

8 At the host Alcatel-Lucent 1665 DMX node, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

9 **Important!** The protection group *Revertive Mode* and *Wait to Restore* parameters apply to 1+1 applications and Bidirectional 1+1 applications only.

If the *Revertive Mode* parameter is disabled, the *Wait to Restore* parameter is not provisionable.

If required, from the System View menu,

1. Select **Configuration** → **Equipment**.
2. Select the **Ptn Grp** tab.
3. Click on the required 1+1 protection group and **Select**.
4. Provision the required protection group parameters according to the work instructions, then click **Apply** and **Close**. If no changes were made, click **Close** and go to the next step.

10 If required, from the System View menu,

1. Select **View** → **Protection**.
2. Select the required 1+1 protection group and click **Select**.
3. Verify that the protection group parameters were provisioned correctly. Then click **Close**.

11 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

12 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

13 At the far-end node that is connecting to the host Alcatel-Lucent 1665 DMX node, provision the required Main/Function/Growth ports, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

If the far-end node is an...	Then...
Alcatel-Lucent 1665 DMX Function/Growth Slot pair,	Repeat Step 4 through Step 12 to provision the required Function/Growth ports and DCC terminations.
Alcatel-Lucent 1665 DMX Main Slot pair,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to provision the required Main ports, DCC terminations, synchronization, and remote NE status functions.
Alcatel-Lucent 1665 DMXtend or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision the required Main/Function/Growth ports, DCC terminations, synchronization, and remote NE status functions.

14 **Important!** The circuit pack in Function/Growth slot 1 of the host Alcatel-Lucent 1665 DMX node must be connected to the far-end circuit pack in Main/Function/Growth slot 1, and the circuit pack in Function/Growth slot 2 of the host Alcatel-Lucent 1665 DMX node must be connected to the far-end circuit pack in Main/Function/Growth slot 2.

Connect the optical fibers and verify the integrity of the optical span being installed.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

15 Perform end-to-end optical line test.

Reference:

- Procedure 14-7: “Perform end-to-end optical line test on Main OLIUs” (p. 14-63)
- Procedure 14-8: “Perform end-to-end optical line test on Function OLIUs” (p. 14-66)

16 At each node in the 1+1 linear network, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

17 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The optical linear extension is now ready for initial service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Figure 9-3 1+1 extension example 1

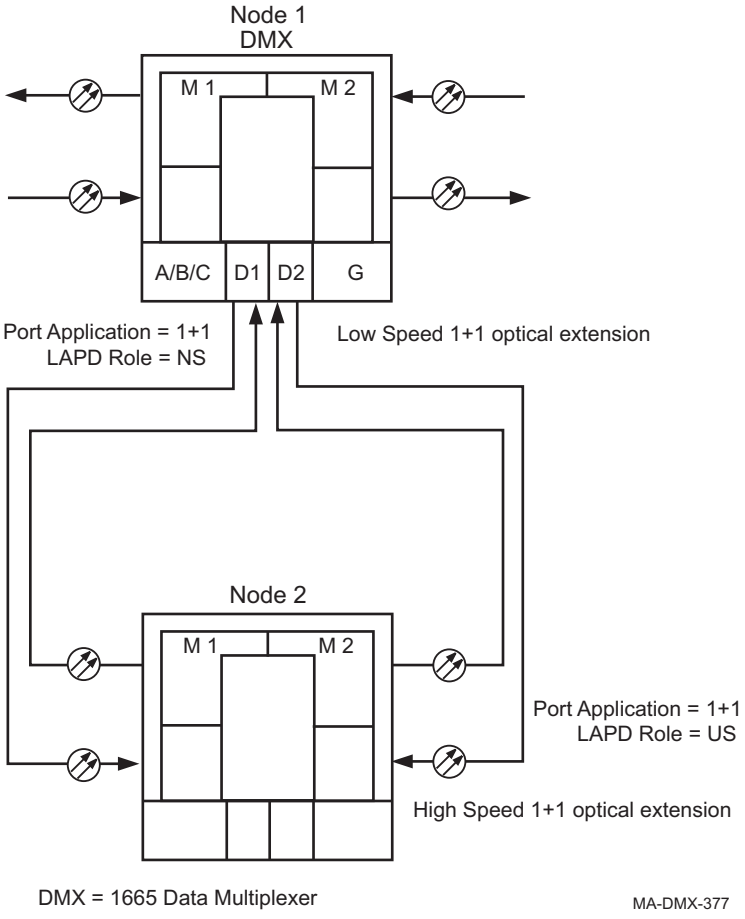
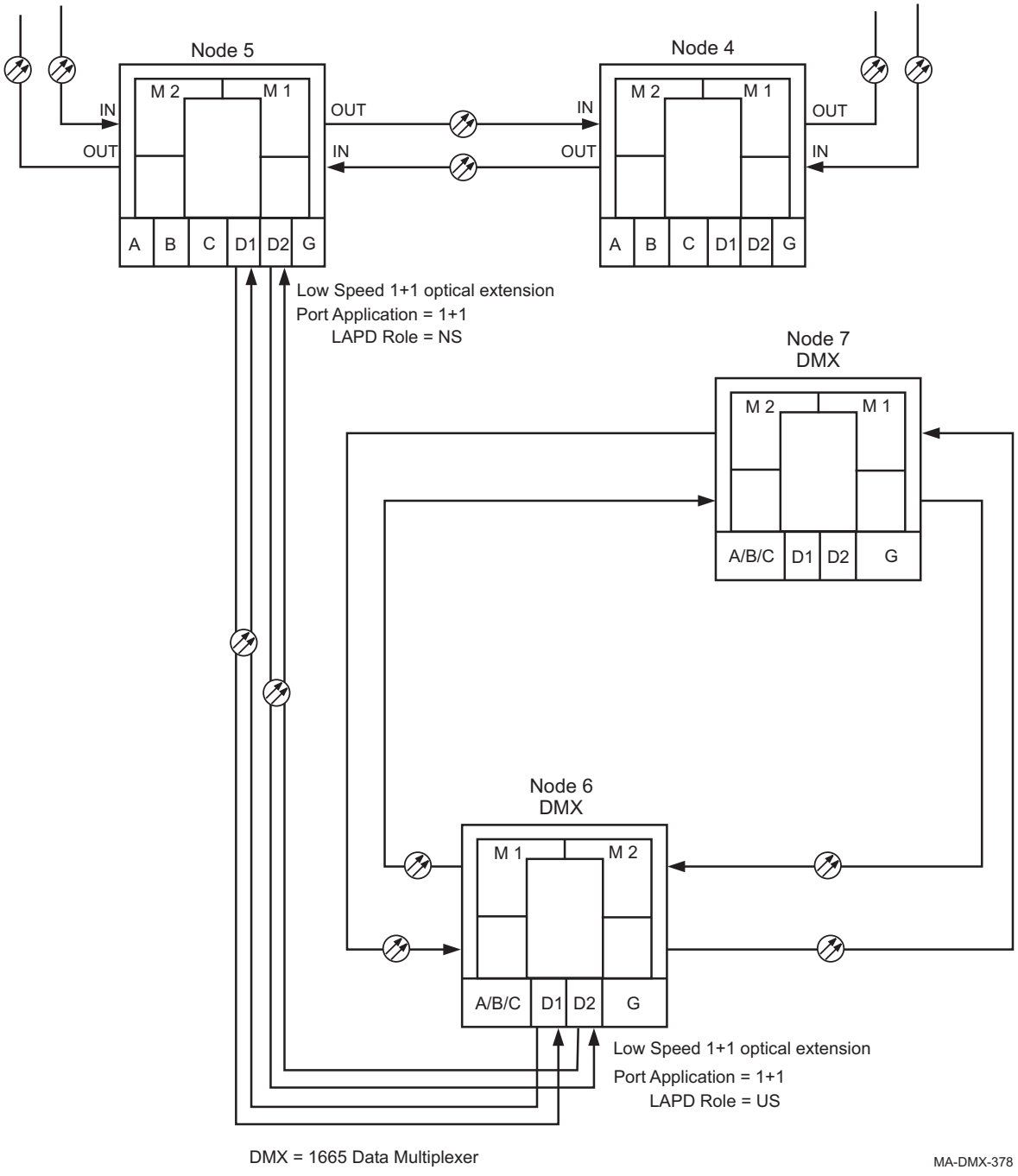


Figure 9-4 1+1 extension example 2



Procedure 9-6: Establish single-homed network

Overview

Use this procedure to establish single-homed OC-3/12/48 access to host Alcatel-Lucent 1665 DMX nodes in a UPSR backbone ring.

Figure 9-5, "Single-homed configuration example" (p. 9-86) shows an example network configuration with single-homed access to a UPSR backbone ring. This allows the single-homed ring to be completed through the UPSR backbone ring. The UPSR backbone ring transports/drops traffic from the single-homed ring. The end-of-path network elements that drop the traffic perform path protection switching.

This procedure assumes that single-homed access is established by interconnecting Alcatel-Lucent 1665 DMX nodes using a Function/Growth slot pair at the host Alcatel-Lucent 1665 DMX node and the OC-3/12/48 *Main* slot pair of the Alcatel-Lucent 1665 DMX nodes in the single-homed ring. However, the Function/Growth slot pair of the host Alcatel-Lucent 1665 DMX node may also be connected in a single-homed ring with the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48 Main slot pair or Function/Growth slot pair. If connecting to an *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1850 TSS-5 using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1850 TSS-5, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Operations Guide, 365-372-401*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMXplore using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXplore, refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMX using OC-3/12/48 Function/Growth slot pair. If connecting to the Function/Growth slots of another Alcatel-Lucent 1665 DMX, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102), as required, when performing this procedure.

  Important! Single-homed access is supported at the host Alcatel-Lucent 1665 DMX nodes using UPSR port applications and UNSWITCHED cross-connection channel applications. This configuration is essentially the same as establishing a subtending UPSR ring, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102), except for the cross-connection applications.

  Ignore all alarms until procedure is complete.

Privilege level

You must log in as either a Privileged user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 9-2), the following equipment is also required:

- Optical power meter
- Lightguide jumpers
- Lightguide BuildOuts (LBOs)

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Verify that you have the necessary work instructions detailing the slots, circuit packs, ports, and network element parameters to be used for this procedure.
4. Verify that the UPSR backbone ring containing the host Alcatel-Lucent 1665 DMX nodes is established and operating properly using the procedures in this manual.
5. Verify that all systems being connected to the host Alcatel-Lucent 1665 DMX nodes have been equipped and operating properly.

Steps

Complete the following steps to establish single-homed OC-3/12/48 access to host Alcatel-Lucent 1665 DMX nodes in a UPSR backbone ring.

1 From your work instructions, determine the network configuration. Refer to Figure 9-5, "Single-homed configuration example" (p. 9-86) for an example. If possible, make a sketch of the existing UPSR backbone ring and the required single-homed connections.

If required, select the **Administration** → **OSI Neighbor Map** command at the host Alcatel-Lucent 1665 DMX node and note the NEs connected to Main 1 and Main 2.

Access each NE identified, select the **Administration** → **OSI Neighbor Map** command, and note the NEs connected to Main 1 and Main 2.

Repeat this step until the UPSR backbone ring can be sketched.

2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the nodes in the existing UPSR backbone ring and the single-homed ring. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX node and the nodes in the single-homed ring.

Reference: Procedure 7-13: "Provision network layer 3 parameters" (p. 7-39)

4 At the host Alcatel-Lucent 1665 DMX node, refer to Nodes 2 and 5 in Figure 9-5, "Single-homed configuration example" (p. 9-86), verify/install OLIU circuit packs and/or pluggable transmission modules in the Function/Growth Group slot pair (A1 and A2, B1 and B2, C1 and C2, D1 and D2, or G1 and G2) being used for access according to the work instructions.

Important! If the work instructions or office records do not specify OLIU types, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs, pluggable transmission modules, and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

The single-homed ring connections to the host Alcatel-Lucent 1665 DMX node must be in two slots in the same Function/Growth group (for example: D1 and D2).

Reference:

- Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX node, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

6 **Important!** For single-homed access, provision the Application parameter to *UPSR* for the low-speed OC-n port pairs being connected.

From the System View menu at the Alcatel-Lucent 1665 DMX host node, select **Configuration** → **Equipment**, select the required low-speed OC-n ports, and provision the port parameters as required from your work instruction.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

7 At the host Alcatel-Lucent 1665 DMX node, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

8 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu at the Alcatel-Lucent 1665 DMX host node, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

9 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

10 At each node in the single-homed ring, provision the required Main/Function/Growth ports, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to provision and verify the required Main ports, DCC terminations, synchronization, and remote NE status functions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required Function/Growth ports and DCC terminations.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision and verify the required ports, DCC terminations, synchronization, and remote NE status functions.

11 Beginning at the host Alcatel-Lucent 1665 DMX node, connect the fibers between the required low-speed OC-n port in Function/Growth slot 1 and the required OC-n port in Main/Function/Growth slot 1 at the adjacent node and verify the integrity of the optical span being established.

Reference: Figure 9-5, "Single-homed configuration example" (p. 9-86) shows the following single-homed connections at the host Alcatel-Lucent 1665 DMX node:

Alcatel-Lucent 1665 DMX Function/Growth slot (A,B,C,D,G)1 (Node 2 and Node 5)	Connects to the M1 OLIU at the adjacent node (Node 7 and Node 8)
Alcatel-Lucent 1665 DMX Function/Growth slot (A,B,C,D,G)2 (Node 2 and Node 5)	Connects to the M2 OLIU at the adjacent node (Node 7 and Node 8)

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

12 Perform end-to-end optical line test on the span being established.

Reference:

- Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)
- Procedure 14-8: "Perform end-to-end optical line test on Function OLIUs" (p. 14-66)

13 Continue around the single-homed ring in the same direction until all nodes are connected.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to connect and test the optical span.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to connect and test the optical span.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to connect and test the optical span.

14 At each node in the single-homed ring, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 If required, repeat this procedure from Step 1 to establish single-homed access at another host Alcatel-Lucent 1665 DMX node in the UPSR backbone ring.

16 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The single-homed access network is now ready for initial service to be established.

Reference:

- Chapter 10, "TDM service provisioning procedures"
- Chapter 11, "Ethernet/Data network provisioning procedures"

END OF STEPS

Configuration

The example in Figure 9-5, “Single-homed configuration example” (p. 9-86) shows a Alcatel-Lucent 1665 DMX UPSR backbone ring consisting of Nodes 1, 2, 3, 4, 5, and 6 with single-homed Nodes 7 and 8.

The host Alcatel-Lucent 1665 DMX nodes support OC-3/12/48 single-homed access in Function/Growth slots A, B, C, D, and G.

The single-homed nodes could be one or more Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, Alcatel-Lucent 1665 DMXplore, and/or any system supporting OC-3/12/48 configurations.

At the host Alcatel-Lucent 1665 DMX nodes, the port Application parameter for the low-speed OC-n ports that connect to the single-homed nodes (Node 5:A1/A2, Node 2:A1/A2) must be provisioned *UPSR* and the cross-connection channel application must be *Unswitched*.

Traffic Flow

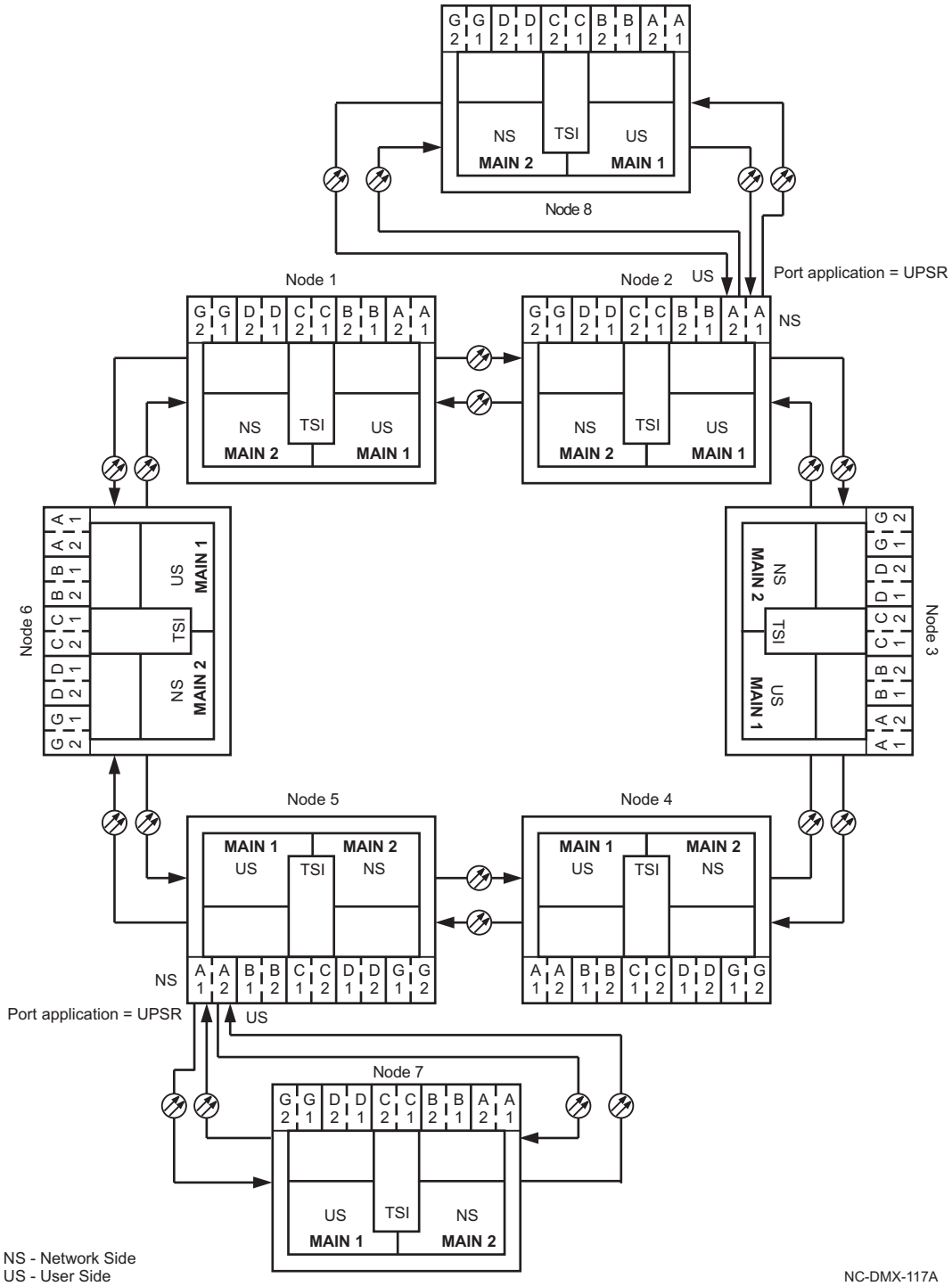
In the following figure, if Node 7 is the source and Node 8 is the destination, traffic will flow as follows when the proper cross-connections are made:

- From Node 7 MAIN 1 to Node 5 A1, then clockwise around the ring from Node 5 MAIN 1 to Node 2 MAIN 2. From Node 2 A2 to Node 8 MAIN 2.
- From Node 7 MAIN 2 to Node 5 A2, then counter-clockwise around the ring from Node 5 MAIN 2 to Node 2 MAIN 1. From Node 2 A1 to Node 8 MAIN 1.

Protection

The single-homed configuration transports traffic through the UPSR backbone ring without any protection switching by the host nodes (Node 5 and Node 2) or pass-through nodes on the UPSR backbone ring. The UPSR terminating nodes (Node 7 and Node 8) perform path protection switching.

Figure 9-5 Single-homed configuration example



Procedure 9-7: Establish dual-homed network

Overview

Use this procedure to establish dual-homed OC-3/12/48 access to host Alcatel-Lucent 1665 DMX nodes in a UPSR backbone ring.

Figure 9-6, "Dual-Homed network configuration example 1" (p. 9-95) and Figure 9-7, "Dual-Homed network configuration example 2" (p. 9-96) show example network configurations with dual-homed access to a UPSR backbone ring. This allows the dual-homed ring to be completed through the UPSR backbone ring. The UPSR backbone ring transports/drops traffic from the dual-homed ring. The end-of-path network elements that drop the traffic perform path protection switching.

This procedure assumes that dual-homed access is established by interconnecting Alcatel-Lucent 1665 DMX nodes using a Function/Growth slot at two host Alcatel-Lucent 1665 DMX nodes and the OC-3/12/48 *Main* slot pair of the Alcatel-Lucent 1665 DMX nodes in the dual-homed ring. However, the Function/Growth slots of the two host Alcatel-Lucent 1665 DMX nodes may also be connected in a dual-homed ring with the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48 Main slot pair or Function/Growth slot pair. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1850 TSS-5 OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1850 TSS-5, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Operations Guide, 365-372-401*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMXplore OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXplore, refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*, as required, when performing this procedure.
- Alcatel-Lucent 1665 DMX (OC-3/12/48 Function/Growth slot pair): If connecting to the Function/Growth slots of another Alcatel-Lucent 1665 DMX, refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102), as required, when performing this procedure.

  Important! If the Main slots at the host Alcatel-Lucent 1665 DMX nodes are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, dual-homed access is supported using 0x1 (recommended) *or* UPSR port applications.

  If the Main slots at the host Alcatel-Lucent 1665 DMX nodes are *not* equipped with Very Large Fabric OLIU circuit packs, dual-homed access is supported using the 0x1S1 and 0x1S2 *or* UPSR port applications.

If the port application is UPSR, then the cross-connection channel application must be UNSWITCHED. This configuration is essentially the same as establishing a subtending UPSR ring [Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102)], except for the cross-connection applications.

Ignore all alarms until procedure is complete.

Privilege level

You must log in as either a Privileged user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 9-2), the following equipment is also required:

- Optical power meter
- Lightguide jumpers
- Lightguide BuildOuts (LBOs)

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Verify that you have the necessary work instructions detailing the slots, circuit packs, ports, and network element parameters to be used for this procedure.
4. Verify that the UPSR backbone ring containing the host Alcatel-Lucent 1665 DMX nodes is established and operating properly.
5. Verify that all systems being connected to the host Alcatel-Lucent 1665 DMX nodes have been equipped and are operating properly.

Steps

Complete the following steps to establish dual-homed OC-3/12/48 access to host Alcatel-Lucent 1665 DMX nodes in a UPSR backbone ring.

1 From your work instructions, determine the network configuration. Refer to Figure 9-6, "Dual-Homed network configuration example 1" (p. 9-95) and Figure 9-7, "Dual-Homed network configuration example 2" (p. 9-96) for examples. If possible, make a sketch of the existing UPSR backbone ring and the required dual-homed connections.

If required, select the **Administration** → **OSI Neighbor Map** command at the host Alcatel-Lucent 1665 DMX node and note the NEs connected to Main 1 and Main 2.

Access each NE identified, select the **Administration** → **OSI Neighbor Map** command, and note the NEs connected to Main 1 and Main 2.

Repeat this step until the UPSR backbone ring can be sketched.

2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the nodes in the existing UPSR backbone ring and the dual-homed ring. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX nodes and the nodes in the dual-homed ring.

Reference: Procedure 7-13: "Provision network layer 3 parameters" (p. 7-39)

4 At the host Alcatel-Lucent 1665 DMX nodes, refer to Nodes 4 and 5 in Figure 9-6, "Dual-Homed network configuration example 1" (p. 9-95) and Figure 9-7, "Dual-Homed network configuration example 2" (p. 9-96), verify/install OLIU circuit packs and/or pluggable transmission modules in the required Function/Growth slots being used for access according to the work instructions.

Important! If the work instructions or office records do not specify OLIU types, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs, pluggable transmission modules, and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

To establish dual-homed access using UPSR interfaces, Function/Growth slot 1 must be used at one host Alcatel-Lucent 1665 DMX node, and Function/Growth slot 2 must be used at the other host Alcatel-Lucent 1665 DMX node.

The companion Function/Growth slot at the host Alcatel-Lucent 1665 DMX nodes may be:

- unequipped (no circuit pack installed)
- equipped with a protection OLIU circuit pack and companion port with no cable connected

- equipped with a protection OLIU circuit pack and the companion socket is unequipped.
- equipped with a different type 0x1 compatible circuit pack (when Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs are in the Main slots)
- equipped with the same type 0x1 compatible circuit pack and the companion port is used for a different 0x1 application (when Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs are in the Main slots)

Reference:

- Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX nodes, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

6 **Important!** If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, provision the Application parameter to *0x1* (recommended) or *UPSR* for all ports used for dual-homed access.

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, provision the Application parameter to *UPSR* for all ports being connected, *or* provision the Application parameter of the port in Function/Growth slot 1 to *0x1S1* and the Application parameter of the port in Function/Growth slot 2 to *0x1S2*.

From the System View menu at the host Alcatel-Lucent 1665 DMX nodes, select **Configuration** → **Equipment**, select the required low-speed OC-n port, and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

7 At the host Alcatel-Lucent 1665 DMX nodes, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

8 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu at the host Alcatel-Lucent 1665 DMX nodes, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

9 From the System View menu at the host Alcatel-Lucent 1665 DMX nodes, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

10 At each node in the dual-homed ring, provision the required Main/Function/Growth ports, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to provision and verify the required Main ports, DCC terminations, synchronization, and remote NE status functions.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to provision and verify the required Function/Growth ports and DCC terminations.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore	Refer to the other product's documentation to provision and verify the required ports, DCC terminations, synchronization, and remote NE status functions.

11 Beginning at a host Alcatel-Lucent 1665 DMX node using a Function/Growth slot, connect the fibers between the required low-speed OC-n port in a Function/Growth slot and the required OC-n port in a Main/Function/Growth slot at the adjacent node and verify the integrity of the optical span being established.

Reference: Figure 9-6, "Dual-Homed network configuration example 1" (p. 9-95) shows the following dual-homed connections at the host Alcatel-Lucent 1665 DMX nodes:

Alcatel-Lucent 1665 DMX Function/Growth slot A1 (Node 5)	Connects to the M1 OLIU at the adjacent node (Node 7)
Alcatel-Lucent 1665 DMX Function/Growth slot A2 (Node 4)	Connects to the M2 OLIU at the adjacent node (Node 8)

In Figure 9-7, "Dual-Homed network configuration example 2" (p. 9-96), note the difference between the Function slot connections for the direction of traffic flow.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

12 Perform end-to-end optical line test.

Reference:

- Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)
- Procedure 14-8: "Perform end-to-end optical line test on Function OLIUs" (p. 14-66)

13 Continue around the dual-homed ring in the same direction until all nodes are connected.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to connect and test the optical span.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Refer to Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102) to connect and test the optical span.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore	Refer to the other product's documentation to connect and test the optical span.

14 At each node in the dual-homed ring, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 If required, repeat this procedure from Step 1 to establish dual-homed access at other host Alcatel-Lucent 1665 DMX nodes in the UPSR backbone ring.

16 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The dual-homed access network is now complete and ready for service to be established.

Reference:

- Chapter 10, "TDM service provisioning procedures"
- Chapter 11, "Ethernet/Data network provisioning procedures"

END OF STEPS

Configuration

The example in Figure 9-6, "Dual-Homed network configuration example 1" (p. 9-95) shows a Alcatel-Lucent 1665 DMX UPSR backbone ring consisting of Nodes 1, 2, 3, 4, 5, and 6. Nodes 1and 2 provide dual-homed access to the backbone ring for Node 9, and Nodes 4 and 5 provide dual-homed access to the backbone ring for Nodes 7 and 8.

The host Alcatel-Lucent 1665 DMX nodes support OC-3/12/48 dual-homed access in Function/Growth slots A, B, C, D, and G.

The dual-homed nodes could be a Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, Alcatel-Lucent 1665 DMXplore, or any system supporting OC-3/12/48 configurations.

The example in Figure 9-7, "Dual-Homed network configuration example 2" (p. 9-96) shows Nodes 4 and 5 providing dual-homed access to Nodes 7 and 8.

At the host Alcatel-Lucent 1665 DMX nodes, the port Application parameter for the low-speed OC-n ports that provide dual-homed access to the backbone ring must be provisioned using one of the following methods.

- If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, provision the Application parameter of both low-speed OC-n ports:
  - *0x1* (recommended), or
  - *UPSR* with the cross-connection channel application *Unswitched*.
- If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, provision the Application parameter of both low-speed OC-n ports:
  - *UPSR* with the cross-connection channel application *Unswitched*, or
  - *0x1S1* if dual-homed ring is cabled to the port in Function/Growth slot 1, and *0x1S2* if dual-homed ring is cabled to the port in Function/Growth slot 2 .

Traffic Flow Example

In Figure 9-6, “Dual-Homed network configuration example 1” (p. 9-95), if Node 7 is the source and Node 9 is the destination, traffic will flow as follows when the proper cross-connections are made:

- From Node 7 MAIN 1 to Node 5 A1, then clockwise around the ring from Node 5 MAIN 1 to Node 1 MAIN 2. From Node 1 A2 to Node 9 MAIN 2.
- From Node 7 MAIN 2 through Node 8 to Node 4 A2, then counter-clockwise around the ring from Node 4 MAIN 2 to Node 2 MAIN 1. From Node 2 A1 to Node 9 MAIN 1.

The Function/Growth ports provisioned *0x1Sn* or *0x1* may be cross-connected to the circuit pack in the Main 1 or Main 2 slot. A Function/Growth port in Function/Growth slot 1 provisioned *UPSR* must be cross-connected to the circuit pack in the Main 1 slot, and a Function/Growth port in Function/Growth slot 2 provisioned *UPSR* must be cross-connected to the circuit pack in the Main 2 slot.

Protection

The dual-homed configuration transports traffic through the network backbone ring without any protection switching by the host nodes or pass-through nodes on the network backbone ring. The UPSR terminating nodes perform the path protection switching.

Figure 9-6 Dual-Homed network configuration example 1

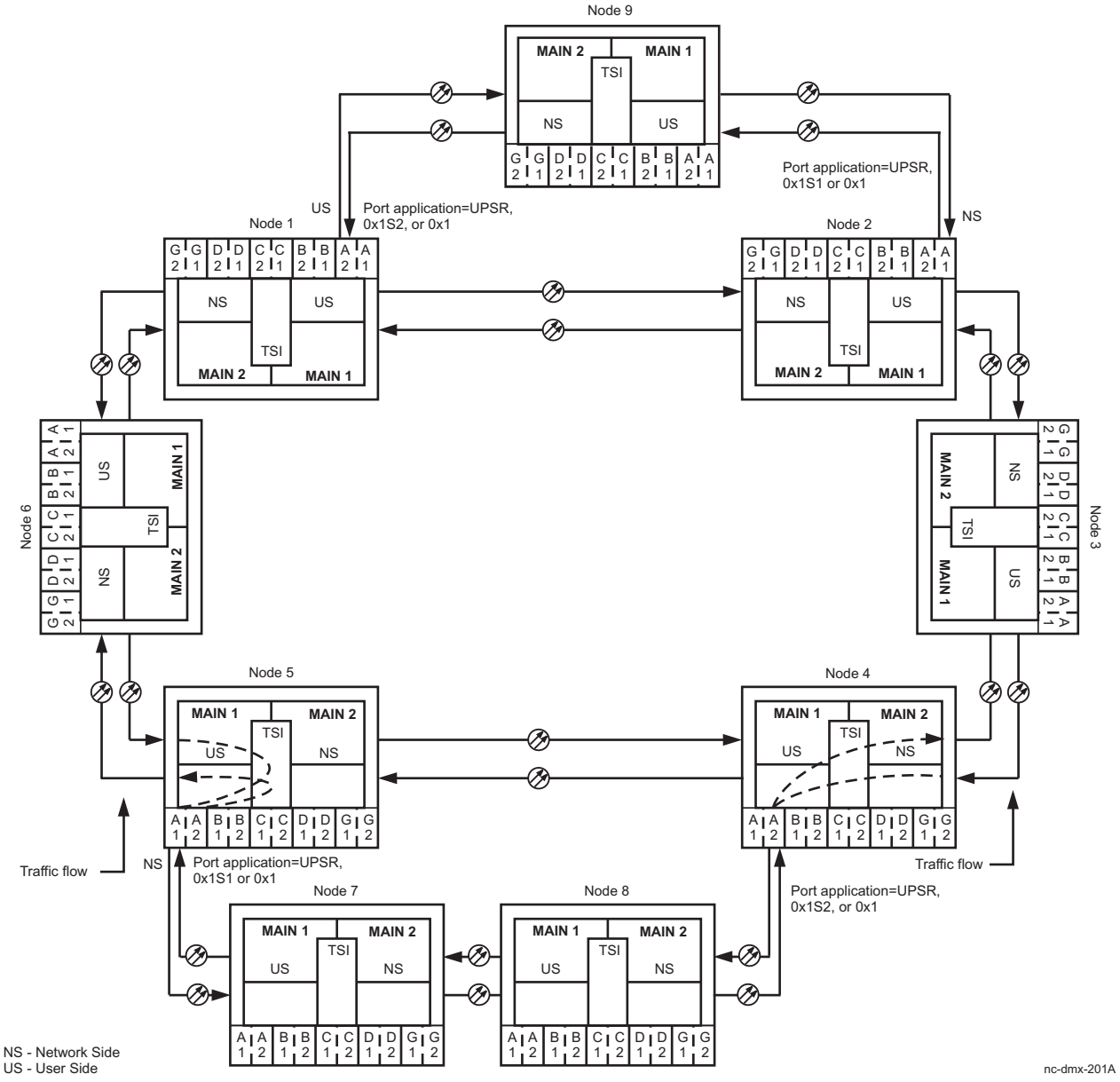
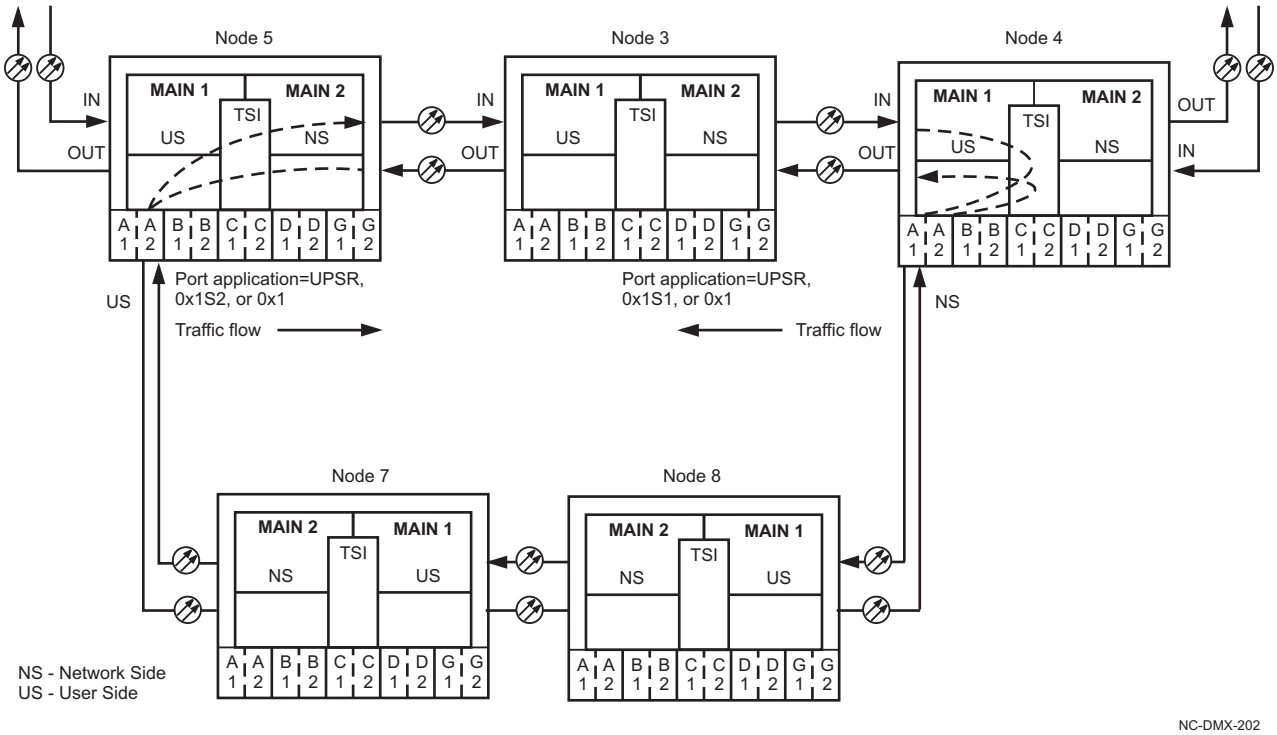


Figure 9-7 Dual-Homed network configuration example 2



Procedure 9-8: Establish low-speed 0x1 unprotected optical extension

Overview

Use this procedure to establish a low-speed 0x1 unprotected OC-3/12/48 optical extension.

Important! This procedure assumes that the low-speed 0x1 unprotected optical extension is established by interconnecting a OC-3/12/48 Function/Growth slot at the host Alcatel-Lucent 1665 DMX to a far-end node.

Ignore all alarms until the procedure is complete.

Privilege level

You must log in as either a Privileged user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 9-2), the following equipment is also required:

- Optical power meter
- Lightguide jumpers
- Lightguide BuildOuts (LBOs).

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Verify that you have the necessary work instructions detailing the slots, circuit packs, ports, and network element parameters to be used for this procedure.
4. Verify that the network containing the host Alcatel-Lucent 1665 DMX node is established and operating properly.
5. Verify that the far-end node being connected to the host Alcatel-Lucent 1665 DMX node has been equipped and is operating properly.

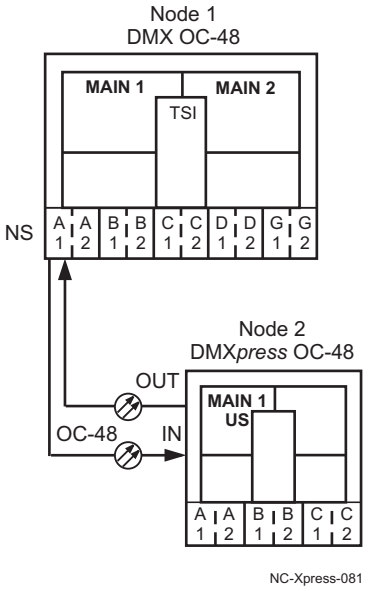
   If the far-end node is a *Metropolis*® DMX*press*, verify that the application option plug (p5) on the OC48/1.3I2 Main circuit pack was set to 0x1 in the unswitched extension. Refer to the Metropolis® *DMXpress Access Multiplexer User Operations Guide, 365-372-314*.

Steps

Complete the following steps to establish a low-speed 0x1 unprotected OC-3/12/48 optical extension.

1 Determine the network configuration using the work instructions and office records. Refer to the example in Figure 9-8, "Example of 0x1 unprotected optical extension" (p. 9-98).

Figure 9-8 Example of 0x1 unprotected optical extension



2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the host Alcatel-Lucent 1665 DMX and the far-end node. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX and the far-end node.

Reference: Procedure 7-13: "Provision network layer 3 parameters" (p. 7-39)

4 At the host Alcatel-Lucent 1665 DMX node, verify/install the required low-speed OLIU circuit packs and/or pluggable transmission modules in the required Function/Growth slots being used for access.

At the extension, verify Main 1 is being used for access (Main 2 is unavailable in this application).

Important! If you plan to use STS-1 tributaries 25-48 on slots A1, B1, or C1 of the host Alcatel-Lucent 1665 DMX node, then the LNW27, LNW29, LNW76, LNW202, LNW221–259 OC-48 or OC-192 circuit packs must be used in the MAIN slots. If the work instructions or office records do not specify OLIU types, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs/pluggable transmission modules and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

The companion Function/Growth slot at the host Alcatel-Lucent 1665 DMX nodes may be:

- unequipped (no circuit pack installed)
- equipped with a protection OLIU circuit pack and companion port with no cable connected
- equipped with a protection OLIU circuit pack and the companion socket is unequipped.
- equipped with a different type 0x1 compatible circuit pack (when Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs are in the Main slots)
- equipped with the same type 0x1 compatible circuit pack and the companion port is used for a different 0x1 application (when Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs are in the Main slots)

Reference:

- Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX node, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

6 **Important!** If the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, provision the port Application parameter to *0x1* (recommended) or *UPSR* at the host node for this application.

If the Main slots are *not* equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs, provision the port Application parameter to *UPSR* or *0x1S1* at the host node for this application.

From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**, select the required port, and provision port parameters as required from your work instruction.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

7 At the host Alcatel-Lucent 1665 DMX node, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

8 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

9 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

10 At the far-end node that is connecting to the host Alcatel-Lucent 1665 DMX node, provision the required ports, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

Refer to the other product's documentation to perform the required provisioning.

11 Connect the optical fibers and verify the integrity of the optical span being installed.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

12 Perform end-to-end optical line test.

Reference: Procedure 14-8: “Perform end-to-end optical line test on Function OLIUs” (p. 14-66)

13 Click the **Alarm List** button and verify that no alarms are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

14 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The 0x1 unprotected optical extension is now ready for initial service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Procedure 9-9: Establish subtending low-speed UPSR/BLSR

Overview

Use this procedure to establish the following subtending low-speed rings:

- OC-3/12/48 UPSR
- OC-48 BLSR (Release 3.0 and later)

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Verify that you have the necessary work instructions detailing the slots, circuit packs, ports, and network element parameters to be used for this procedure.
4. Verify that the network containing the host Alcatel-Lucent 1665 DMX node is established and operating properly.
5. Verify that all systems being connected to the host Alcatel-Lucent 1665 DMX have been equipped and operating properly.

Steps

Complete the following steps to establish a subtending low-speed UPSR/BLSR.

1

If establishing a subtending low-speed...	Then...
UPSR,	Proceed to Procedure 9-9.1: "Establish subtending low-speed UPSR" (p. 9-103).
BLSR,	Proceed to Procedure 9-9.2: "Establish subtending low-speed BLSR" (p. 9-110).

END OF STEPS

Procedure 9-9.1: Establish subtending low-speed UPSR

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102).

Steps

Important! This procedure establishes a subtending low-speed OC-3/12/48 UPSR. Note that this configuration differs from a single-homed application in that it supports ring closure by providing path protection switching, and by allowing low-speed pass-through cross-connections.

This procedure assumes that the subtending ring is established by interconnecting Alcatel-Lucent 1665 DMX nodes using a Function/Growth slot at the host Alcatel-Lucent 1665 DMX node and the OC-12/48 Main/Function/Growth slot pair of the Alcatel-Lucent 1665 DMX nodes in the subtending ring. However, the Function/Growth slots of the host Alcatel-Lucent 1665 DMX node may also be connected in a subtending ring with the following:

- Alcatel-Lucent 1665 DMXtend using OC-3/12/48 Main slot pair or OC-3/12/48 Function/Growth slot pair. If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.
- Alcatel-Lucent 1850 TSS-5 using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1850 TSS-5, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Operations Guide, 365-372-401* as required, when performing this procedure.
- Alcatel-Lucent 1665 DMXplore using OC-3/12 Main slot pair. If connecting to an Alcatel-Lucent 1665 DMXplore, refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332* as required, when performing this procedure.

Ignore all alarms until procedure is complete.

Complete the following steps to establish a subtending low-speed UPSR.

1 From your work instructions, determine the network configuration. Refer to Figure 9-9, "Subtending UPSR configuration example" (p. 9-108) for an example. If possible, make a sketch of the existing network and the required subtending ring connections.

If required, select the **Administration** → **OSI Neighbor Map** command at the host Alcatel-Lucent 1665 DMX node and note the NEs connected to Main 1 and Main 2.

Access each NE identified, select the **Administration** → **OSI Neighbor Map** command, and note the NEs connected to Main 1 and Main 2.

Repeat this step until the network can be sketched.

2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the nodes in the existing network and the subtending ring. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX node and the nodes in the subtending ring.

Reference: Procedure 7-13: "Provision network layer 3 parameters" (p. 7-39)

4 At the host Alcatel-Lucent 1665 DMX node, refer to Node 5 in Figure 9-9, "Subtending UPSR configuration example" (p. 9-108), install OLIU circuit packs and/or pluggable transmission modules in Function Group or Growth slot pair (A1 and A2, B1 and B2, C1 and C2, D1 and D2, or G1 and G2) being used for access according to the work instructions.

Important! If the work instructions or office records do not specify OLIU types, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs, pluggable transmission modules, and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

The subtending ring connections to the host Alcatel-Lucent 1665 DMX node must be in two slots in the same Function/Growth group (for example: A1 and A2.)

Reference:

- Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX node, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

6 **Important!** The Application parameter of the low-speed OC-n port pairs being connected must be provisioned *UPSR*.

From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**, select the required low-speed OC-n ports, and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

7 At the host Alcatel-Lucent 1665 DMX node, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

8 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

9 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

10 At each node in the subtending ring, provision the required Main/Function/Growth ports, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to provision and verify the required Main ports, DCC terminations, synchronization, and remote NE status functions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Repeat Step 4 through Step 9 to provision and verify the required Function/Growth ports and DCC terminations.
Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1850 TSS-5, or Alcatel-Lucent 1665 DMXplore,	Refer to the other product's documentation to provision and verify the required ports, DCC terminations, synchronization, and remote NE status functions.

11 Beginning at the host Alcatel-Lucent 1665 DMX node, connect the fibers between the required low-speed OC-n port in Function/Growth slot 1 and the required OC-n port in Main slot 1 or Function/Growth slot 2 at the adjacent node and verify the integrity of the optical span being established.

Refer to Figure 9-9, "Subtending UPSR configuration example" (p. 9-108) when connecting fibers. The following connections are required at the host Alcatel-Lucent 1665 DMX node:

Alcatel-Lucent 1665 DMX Function/Growth slot A1, B1, C1, D1, or G1 (Node 5)	Connects to the M1 OLIU or Function/Growth slot 2 OLIU (A2, B2, C2, D2, or G2) of the subtending shelf
Alcatel-Lucent 1665 DMX Function/Growth slot A2, B2, C2, D2, or G2 (Node 5)	Connects to the M2 OLIU or Function/Growth slot 1 OLIU (A1, B1, C1, D1, or G1) of the subtending shelf

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

12 Perform end-to-end optical line test.

Reference:

- Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)
- Procedure 14-8: "Perform end-to-end optical line test on Function OLIUs" (p. 14-66)

13 Repeat Step 11 and Step 12 for each optical span in the subtending UPSR. Continue around the subtending ring in the same direction until all nodes are connected. Refer to the example at the end of the procedure.

14 At each node in the subtending ring, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

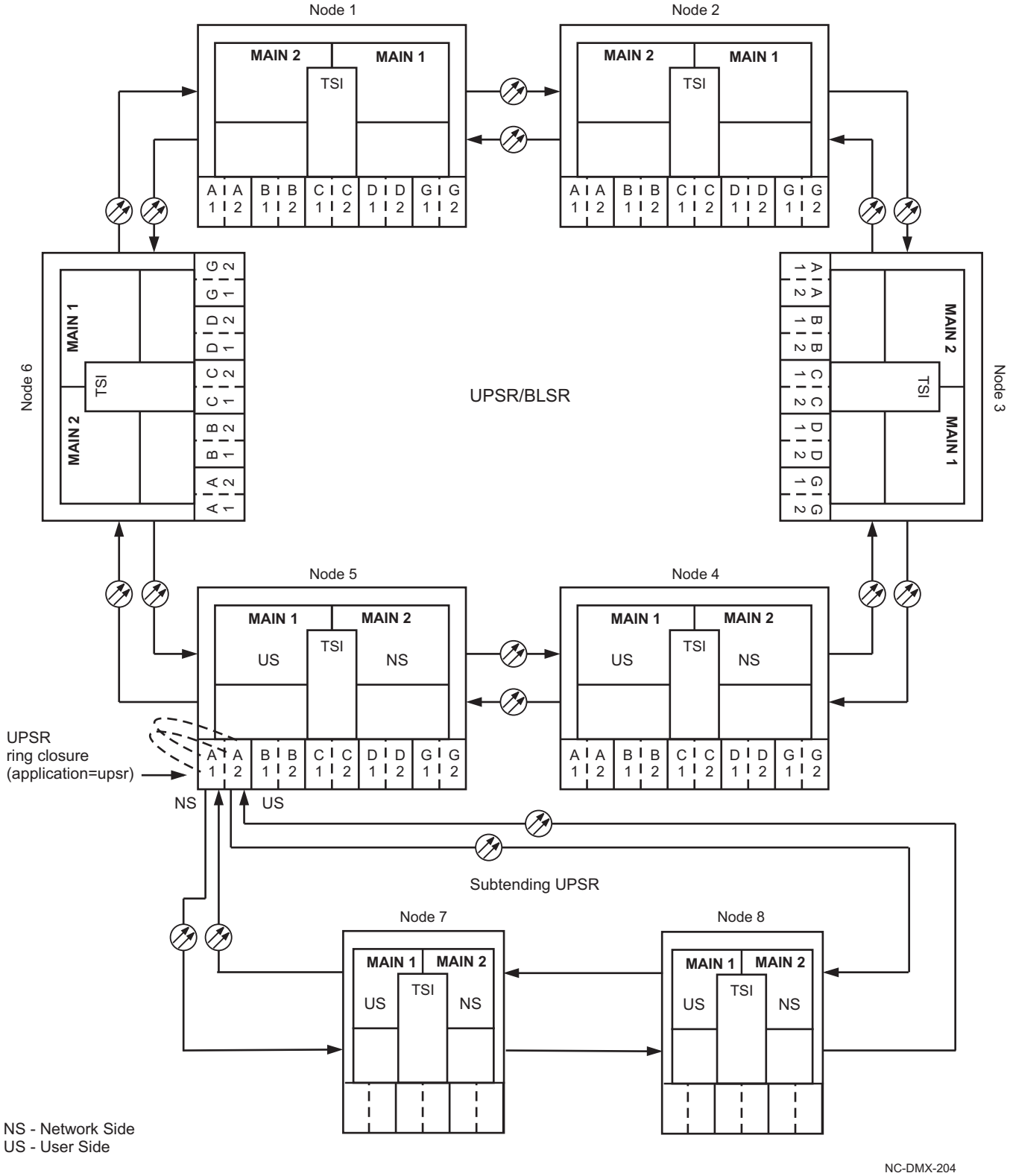
The subtending ring is now ready for initial service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Figure 9-9 Subtending UPSR configuration example



Procedure 9-9.2: Establish subtending low-speed BLSR

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102).

Steps

Important! This procedure assumes that the subtending ring is established by interconnecting Alcatel-Lucent 1665 DMX nodes using a Function/Growth slot at the host Alcatel-Lucent 1665 DMX node and the OC-48 Main/Function/Growth slot pair of the Alcatel-Lucent 1665 DMX nodes in the subtending ring.

Ignore all alarms until procedure is complete.

Complete the following steps to establish a subtending low-speed OC-48 2-fiber BLSR. (Refer to the example in Figure 9-10, "Subtending 2-fiber BLSR example" (p. 9-116) and 2-fiber bidirectional line switched ring worksheet at the end of this procedure when performing this procedure.)

1 From your work instructions, determine the network configuration. Refer to Figure 9-10, "Subtending 2-fiber BLSR example" (p. 9-116) for an example. If possible, make a sketch of the existing network and the required subtending ring connections.

If required, select the **Administration** → **OSI Neighbor Map** command at the host Alcatel-Lucent 1665 DMX node and note the NEs connected to Main 1 and Main 2.

Access each NE identified, select the **Administration** → **OSI Neighbor Map** command, and note the NEs connected to Main 1 and Main 2.

Repeat this step until the network can be sketched.

2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the nodes in the existing network and the subtending ring. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: "Set/change system TID" (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX node and the nodes in the subtending ring.

Reference: Procedure 7-13: “Provision network layer 3 parameters” (p. 7-39)

4 **Important!** When the Main slot pair is equipped with LNW26B OC-48 OLIU circuit packs, low-speed OC-48 BLSRs are only supported in slot pair D1 and D2 or G1 and G2 only. Alcatel-Lucent 1665 DMX supports up to two subtending BLSRs.

At the host Alcatel-Lucent 1665 DMX node, refer to DMX Node 5 in Figure 9-10, “Subtending 2-fiber BLSR example” (p. 9-116), install the OLIU circuit packs in the appropriate Function/Growth slot pair (A1 and A2, B1 and B2, C1 and C2, D1 and D2, or G1 and G2).

Important! If the work instructions or office records do not specify OLIU types, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

The subtending ring connections to the host Alcatel-Lucent 1665 DMX node must be in two slots in the same Function/Growth group (for example: A1 and A2.)

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX node, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

6 **Important!** The Application parameter of the low-speed OC-n port pairs being connected must be provisioned *2F BLSR*.

Up to 15 BLSR protection groups may be supported by a single network element when the Main slots are equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs.

From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**, select the required low-speed OC-n ports, and provision the port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

7 At the host Alcatel-Lucent 1665 DMX node, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

8 From the system view at the host Alcatel-Lucent 1665 DMX node,

1. Select **Configuration** → **Equipment**.
2. Select the **Ring ID** tab and expand the required ring by clicking on the plus sign (+).
3. Click on the required 2F BLSR protection group and **Select**.
4. Provision the required protection group parameters according to the work instructions, then click **Apply** and **Close**. If no changes were made, click **Close** and go to the next step.

9 From the System View menu,

1. Select **View** → **Protection**.
2. Select the required *2F BLSR* protection group and click **Select**.
3. Click on the *Provisionable Parameters* tab and verify that the protection group parameters were provisioned correctly. Then click **Close**.

10

If...	Then...
automatic ring discovery was provisioned at each node,	Continue with Step 11.
manual ring discovery was provisioned at each node,	At the host node, establish a new manual ring map. Refer to Procedure 9-4: "Provision manual ring map" (p. 9-65).

11 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

12 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

13 At each node in the subtending ring, provision the required Main/Function/Growth ports, 2-fiber BLSR protection group, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX and the Main ports are used,	Refer to Procedure 9-1: "Establish high-speed end-to-end Alcatel-Lucent 1665 DMX network" (p. 9-3) to provision and verify the required Main ports, DCC terminations, synchronization, and remote NE status functions.
Alcatel-Lucent 1665 DMX and the Function/Growth ports are used,	Repeat Step 4 through Step 12 to provision and verify the required Function/Growth ports, 2-fiber BLSR protection group, and DCC terminations.

14 Beginning at the host Alcatel-Lucent 1665 DMX node, connect the fibers between the required low-speed OC-n port in Function/Growth slot 1 and the required OC-n port in Main/Function/Growth slot 2 at the adjacent node and verify the integrity of the optical span being established.

Reference: Refer to Figure 9-10, "Subtending 2-fiber BLSR example" (p. 9-116) when connecting fibers. The following connections are required at the host Alcatel-Lucent 1665 DMX node:

Function/Growth slot A1, B1, C1, D1, or G1 at (Node 5)	connects to the M2 OLIU or Function/Growth slot 2 OLIU (A2, B2, C2, D2, or G2) of the subtending shelf
Function/Growth slot A2, B2, C2, D2, or G2 (Node 5)	connects to the M1 OLIU or Function/Growth slot 1 OLIU (A1, B1, C1, D1, or G1) of the subtending shelf

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

15 Perform end-to-end optical line test.

Reference:

- Procedure 14-7: "Perform end-to-end optical line test on Main OLIUs" (p. 14-63)
- Procedure 14-8: "Perform end-to-end optical line test on Function OLIUs" (p. 14-66)

16 Repeat Step 14 and Step 15 for each optical span in the subtending 2-fiber BLSR. Continue around the subtending ring in the same direction until all nodes are connected. Refer to the example at the end of the procedure.

17

If automatic ring discovery was provisioned...	Then...
enabled at each node,	**Important!** As the ring is connected, nodes automatically communicate with each other using the data communications channel (DCC) and build a ring map. If successful, automatic ring discovery builds a ring map at each node and the `Ring Discovery in Progress` condition clears. If unsuccessful, the ring map is not complete and alarms are reported. At the host node, select **View** → **Ring Map** → **Ring Map**. Then click on the appropriate ring and **Select**. The ring map information appears. If the ring is incomplete and alarms are present, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*.
disabled at each node,	go to the next step.

18 At the host Alcatel-Lucent 1665 DMX node, verify 2-fiber BLSR protection switching:

1. Select **Fault** → **Protection Switch**. Select the required protection group and click **Select**. Choose the **East** or **West** direction with switch type **Manual to Protection, Ring**. Click **Apply**.
2. Select **View** → **Protection**. Select the required protection group and click **Select**. Observe the Ring Node APS (Automatic Protection Switch) State, East Switch Request State, West Switch Request State, East Channel State, and West Channel State parameters. Verify the 2-fiber BLSR protection switch was performed.
3. Select **Fault** → **Protection Switch**. Select the required protection group and click **Select**. Choose the required direction with switch type **Clear**. Click **Apply**.

Repeat this step at each node in the subtending 2-fiber BLSR (refer to the 2-fiber BLSR worksheet at the end of the procedure) to verify protection switching.

19 At each node in the subtending ring, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

20 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

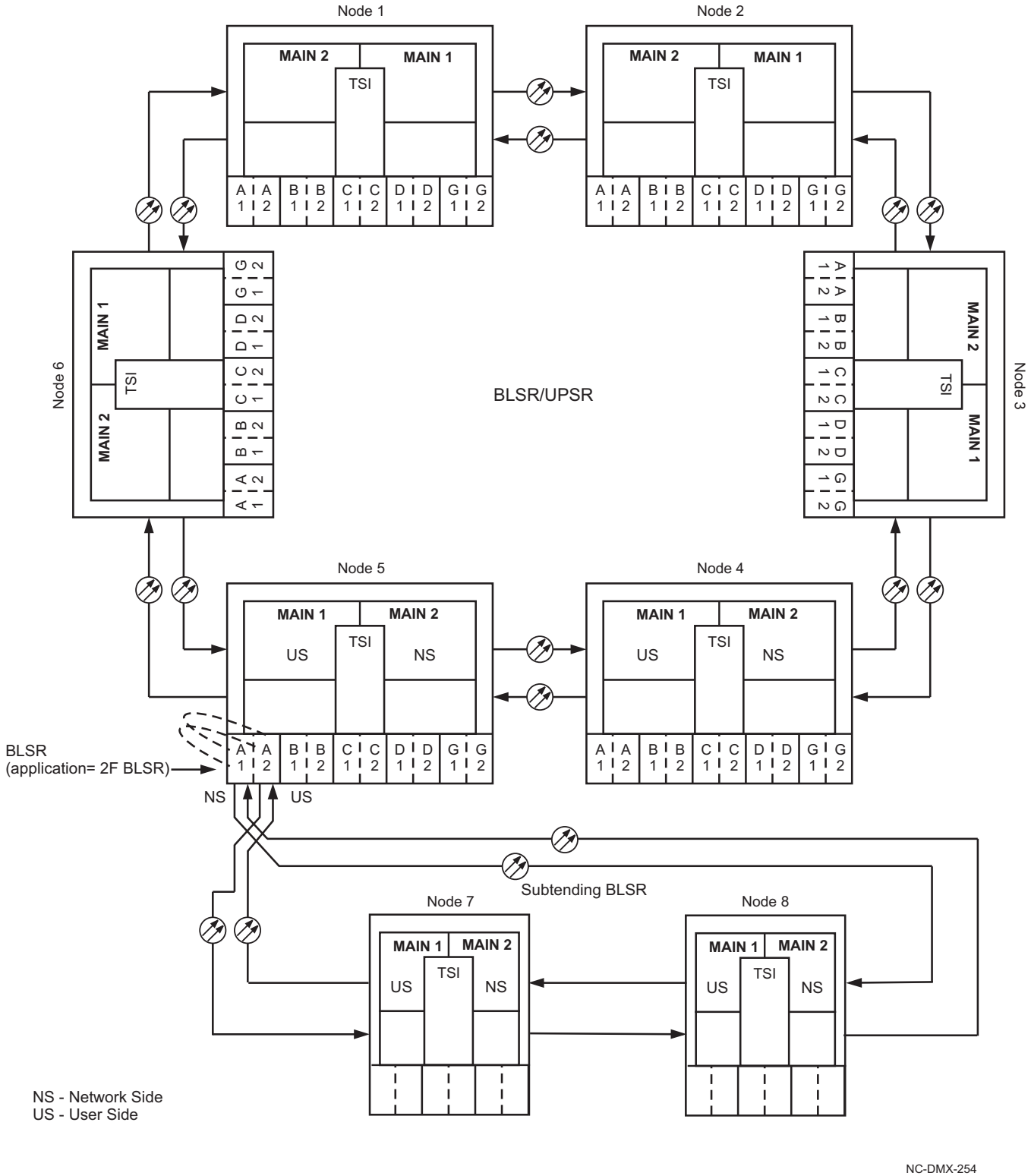
The subtending ring is now ready for initial service to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”

END OF STEPS

Figure 9-10 Subtending 2-fiber BLSR example



2-Fiber BLSR Worksheet

2-FIBER RING WORKSHEET _____ SPAN NAME/ID _____

N	N+1
TID=	
Ring ID: _____	TID=
Node ID: _____	Node ID: _____
Protection Group AID _____	Protection Group AID _____
OUT Fiber Color/ID _____	IN Fiber Color/ID _____
	Received Power Level _____
IN Color/ID _____	Required IN PAD _____
Received Power Level _____	
Required LBO _____	OUT Fiber Color _____

NC-USM-216

Procedure 9-10: Add IP route(s) through network

Overview

Use this procedure to add IP Routes (IP Tunnels) through the data communications channel (DCC) OSI-based network.

Privilege level

You must log in as a Privileged user to complete this procedure.

IP routing examples

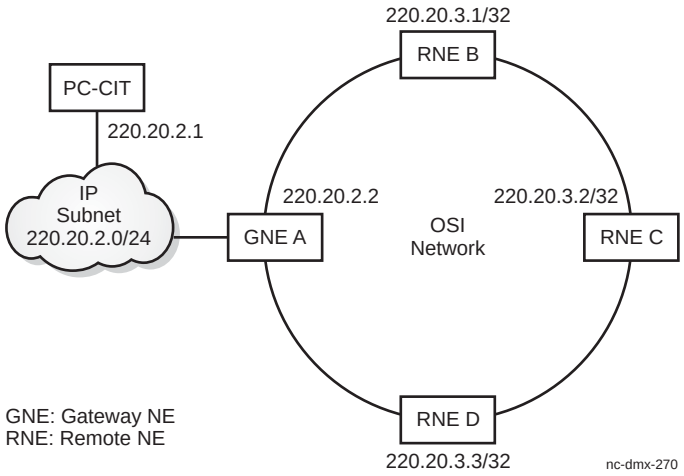
The following examples illustrate different methods of establishing IP routes through a network.

Each example is followed by the necessary instructions to program that example. In addition, tables are provided that list the required provisioning for the *WaveStar*® CIT, NEs, OMS, Router, and AnyMedia OS for each scenario.

Example 1: Local access over LAN

In this example, Figure 9-11, “Local access over LAN” (p. 9-118), the PC-CIT is both the OS and FTP Server and is connected on the same subnet as GNE i.e. local access over the Local Area Network (LAN).

Figure 9-11 Local access over LAN



No manual route for the OS needs to be added in GNE as it would appear in GNE's routing table as a local entry.

ALL NEs are connected over a ring (over OSI-based DCC) and communicate using OSI, identifying each other through the NSAP addresses. They all support IP stack and thus have IP addresses and subnet masks assigned. Here, they are DMX Product Family IP NEs but could also be connected to IP-only NEs (e.g. a case of IP Fringe discussed later).

How to Provision Example 1

Use the following information along with the Step instructions for this procedure to provision the route illustrated in Example 1:

At ...	Provision ...
PC-CIT	Provision its own IP address (220.20.2.1) and subnet mask (24 or 255.255.255.0). Provision GNE with IP address 220.20.2.2 as default router
GNE	Provision its own IP address (220.20.2.2) and subnet mask (24 or 255.255.255.0) for the rear LAN port. Enable TCP/IP Function on the rear LAN port. No need to provision manual route to PC-CIT since GNE would advertise it as local entry within its own area. Ensure that TAP Advertise and TAP Learn are enabled.
RNE B	Provision its own IP address (220.20.3.1) and subnet mask (32 or 255.255.255.255) for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled.

Use the following routing information at the PC-CIT to provision the route illustrated in Example 1:

	Destination	Gateway	Interface	Comments
PC-CIT				
	220.20.2.1/24	-	lan	populated by stack
	default	220.20.2.2	lan	populated by stack

Use the following routing information at the GNE/RNE to provision the route illustrated in Example 1:

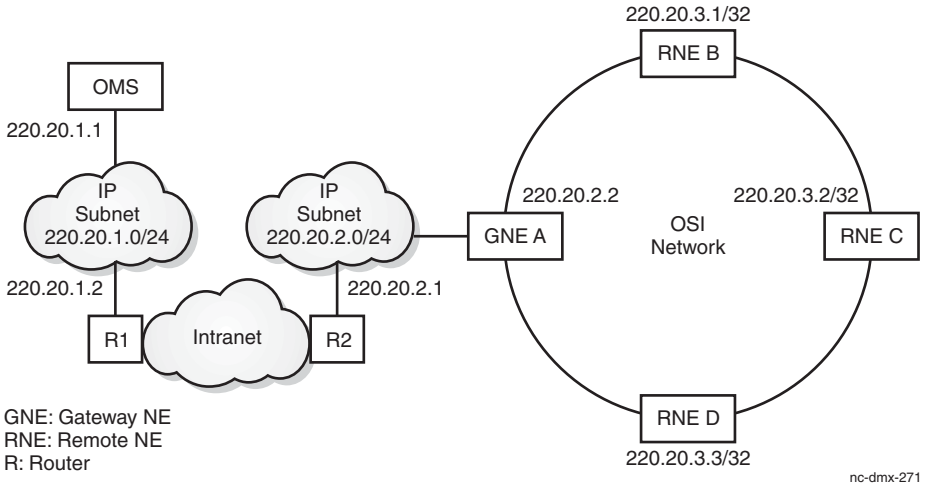
	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
GNE						

	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
	220.20.2.2/24	LAN	-	local	no	20
	220.20.2.1/24	LAN	220.20.2.1	local	yes	20
	220.20.3.1/32	CLNP_ TUNNEL	<NSAP-B>	TAP	yes	20
	220.20.3.2/32	CLNP_ TUNNEL	<NSAP-C>	TAP	yes	20
	220.20.3.3/32	CLNP_ TUNNEL	<NSAP-D>	TAP	yes	20
RNE B						
	220.20.3.1/32	LAN	-	local	yes	20
	220.20.2.1/24	CLNP_ TUNNEL	<NSAP-A>	TAP	yes	20
	220.20.3.2/32	CLNP_ TUNNEL	<NSAP-C>	TAP	yes	20
	220.20.3.3/32	CLNP_ TUNNEL	<NSAP-D>	TAP	yes	20

Example 2: Access over IP WAN

In this example, Figure 9-12, “Access over IP WAN” (p. 9-120), the GNE is accessed over the Internet Protocol Wide Area Network (IP WAN). OMS and the GNE are connected over a private internet/intranet via routers, R1 and R2.

Figure 9-12 Access over IP WAN



OMS and router R1 are on the same subnet 220.20.1.0/24 and router R2 and GNE are on another subnet 220.20.2.0/24. ALL NEs are connected over a ring (over OSI-based DCC) and communicate using OSI and identify each other through the NSAP addresses. Here, they are standalone IP NEs but could also be connected to IP-only NEs (e.g. a case of IP Fringe discussed later).

How to Provision Example 2

Use the following information along with the Step instructions for this procedure to provision the route illustrated in Example 2:

At ...	Provision ...
OMS	Provision its own IP address (220.20.1.1) and subnet mask (24 or 255.255.255.0) Provision router, R1 with IP address 220.20.1.2 as default router
Router R1	Provision IP addresses for its all interfaces - IP address (220.20.1.2) and subnet mask (24 or 255.255.255.0) - IP address for the interface connecting to intranet and the subnet mask of the directly attached subnet - If routers don't autoshare static routes, then Provision a static route to a subnet address which can cover maximum number of RNEs e.g. 220.20.3.0/24 as destination and GNE's IP address 220.20.2.2 as next-hop-address
Router R2	Provision IP addresses for its all interfaces - IP address (220.20.2.1) and subnet mask (24 or 255.255.255.0) - IP address for the interface connecting to intranet and the subnet mask of the directly attached subnet Provision a static route to a subnet address which can cover maximum number of RNEs e.g. 220.20.3.0/24 as destination and GNE's IP address 220.20.2.2 as next-hop-address
GNE	Provision its own IP address (220.20.2.2) and subnet mask (24 or 255.255.255.0) for the rear LAN port. Enable TCP/IP Function on the rear LAN port. Provision R2 as default router with IP address 220.20.2.1 Provision manual route to OMS which it would advertise within its own OSI Level 1 area. The manual route would have OMS IP address 220.20.1.1/32 as destination and router R2's IP address 220.20.2.1 as next-hop-address. Ensure that TAP Advertise and TAP Learn are enabled.

At ...	Provision ...
RNE B	Provision its own IP address (220.20.3.1) and subnet mask (32 or 255.255.255.255) for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled.

Use the following routing information at the OMS and Router to provision the route illustrated in Example 2:

	Destination	Gateway	Interface	Comments
OMS				
	220.20.1.1/24	-	lan	populated by stack
	default	220.20.1.2	lan	populated by stack
Router				
R1	220.20.1.2/24	-	lan	populated by stack
	220.20.3.0/24	220.20.2.2	lan	*1.* populated by OSPF (if static routes autoshare) *2.* manual (if static routes not autoshare e.g. in Cajun 550)
R2	220.20.2.1/24	-	lan	populated by stack
	220.20.3.0/24	220.20.2.2	lan	manual

Use the following routing information at the GNE/RNE to provision the route illustrated in Example 2:

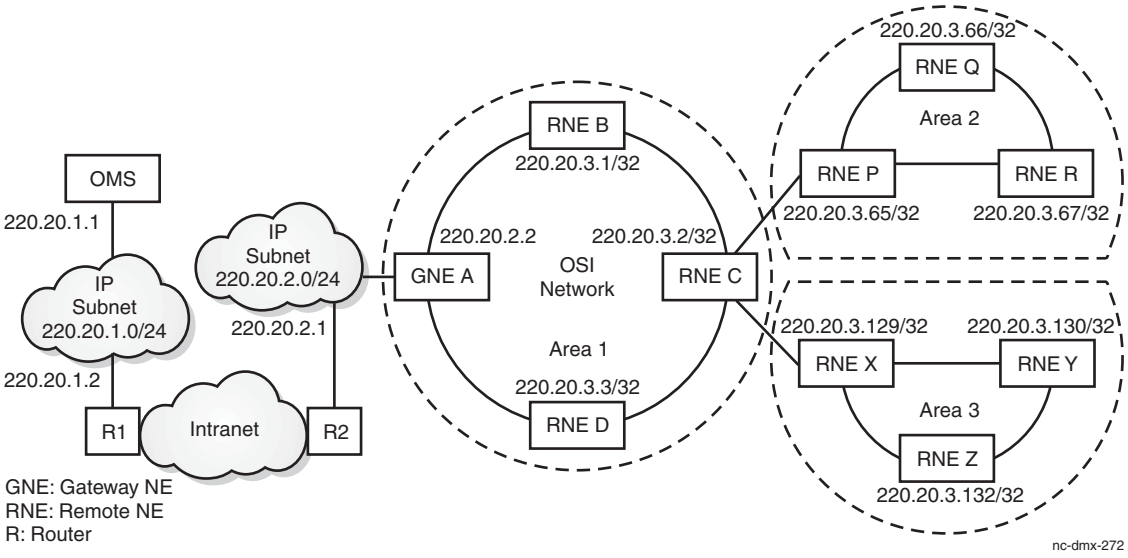
	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
GNE						
	220.20.2.2/24	LAN	-	local	no	20
	default	LAN	220.20.2.1	local	no	20
	220.20.1.1/32	LAN	220.20.2.1	manual	yes	20
	220.20.3.1/32	CLNP_TUNNEL	<NSAP-B>	TAP	yes	20
	220.20.3.2/32	CLNP_TUNNEL	<NSAP-C>	TAP	yes	20

	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
	220.20.3.3/32	CLNP_TUNNEL	<NSAP-D>	TAP	yes	20
RNE B						
	220.20.3.1/32	LAN	-	local	yes	20
	220.20.1.1/32	CLNP_TUNNEL	<NSAP-A>	TAP	yes	20
	220.20.3.2/32	CLNP_TUNNEL	<NSAP-C>	TAP	yes	20
	220.20.3.3/32	CLNP_TUNNEL	<NSAP-D>	TAP	yes	20

Example 3: Multi-Area operations

In this example, Figure 9-13, “Multi-Area operations” (p. 9-123), an extension to Example 2, we have added other NEs that are deployed in different areas (1, 2, and 3). RNE C, P, and X are level-2 routers which enable communications across areas. But the manual route to OMS provisioned at GNE wouldn't be advertised by RNE C to other areas. This requires establishing manual routes across areas which are then advertised by Level 2 routers within their areas. Each area can be represented by a single subnet. This also requires adding static entries to each subnet in Router R2.

Figure 9-13 Multi-Area operations



Careful planning and design of subnet addresses for these areas could reduce the number of static entries required at Router R2.

How to Provision Example 3

Use the following information along with the Step instructions for this procedure to provision the route illustrated in Example 3:

At ...	Provision ...
OMS	Provision its own IP address (220.20.1.1) and subnet mask (24 or 255.255.255.0) Provision router, R1 with IP address 220.20.1.2 as default router
Router R1	Provision IP addresses for its all interfaces - IP address (220.20.1.2) and subnet mask (24 or 255.255.255.0) - IP address for the interface connecting to intranet and the subnet mask of the directly attached subnet - If routers don't autoshare static routes, then Provision a static route to a subnet address which can cover maximum number of RNEs e.g. 220.20.3.0/24 as destination covers subnets 220.20.3.0/26, 220.20.3.64/26 and 220.20.3.128/26. The GNE's IP address 220.20.2.2 as next-hop-address.
Router R2	Provision IP addresses for its all interfaces - IP address (220.20.2.1) and subnet mask (24 or 255.255.255.0) - IP address for the interface connecting to intranet and the subnet mask of the directly attached subnet Provision a static route to a subnet address which can cover maximum number of RNEs e.g. 220.20.3.0/24 as destination covers subnets 220.20.3.0/26, 220.20.3.64/26 and 220.20.3.128/26. The GNE's IP address 220.20.2.2 as next-hop-address.
GNE	Provision its own IP address (220.20.2.2) and subnet mask (24 or 255.255.255.0) for the rear LAN port. Enable TCP/IP Function on the rear LAN port. Provision R2 as default router with IP address 220.20.2.1 Provision manual route to OMS which it would advertise within its own area. The manual route would have OMS IP address 220.20.1.1/32 as destination and router R2's IP address 220.20.2.1 as next-hop-address. Ensure that TAP Advertise and TAP Learn are enabled. Provision manual route for two areas with RNE P's and RNE X's IP addresses (220.20.3.65/26 and 220.20.3.129/26) as destination and their respective NSAP addresses as the next hop address. No need to advertise this entry. (In case, any area can't be covered with one subnet, more than one route might have to be added)

At ...	Provision ...
RNE C	Provision its own IP address (220.20.3.2) and subnet mask (32 or 255.255.255.255) for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled.
RNE P	Provision its own IP address (220.20.3.65) and subnet mask (32 or 255.255.255.255) for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled. Provision manual route to GNE which it would advertise within its own area. The manual route would have OMS IP address 220.20.1.1/32 as destination and GNE's NSAP address as the next-hop address. Set advertise enable for this entry.
RNE X	Provision its own IP address (220.20.3.129) and subnet mask (32 or 255.255.255.255) for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled. Provision manual route to GNE which it would advertise within its own area. The manual route would have OMS IP address 220.20.1.1/32 as destination and GNE's NSAP address as the next-hop address. Set advertise enable for this entry.
RNE R	Provision its own IP address (220.20.3.67) and subnet mask (32 or 255.255.255.255) for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled.

Use the following routing information at the OMS and NE (GNE/RNE) to provision the route illustrated in Example 3:

	Destination	Gateway	Interface	Comments
OMS				
	220.20.1.1/24	-	lan	populated by stack
	default	220.20.1.2	lan	populated by stack
Router				
R1	220.20.1.2/24	-	lan	populated by stack

	Destination	Gateway	Interface	Comments
	220.20.3.0/24	220.20.2.2	lan	*1.* populated by OSPF (if static routes autoshare) *2.* manual (if static routes not autoshare e.g. in Cajun 550)
R2	220.20.2.1/24	-	lan	populated by stack
	220.20.3.0/24	220.20.2.2	lan	manual

Use the following routing information at the GNE/RNE to provision the route illustrated in Example 3:

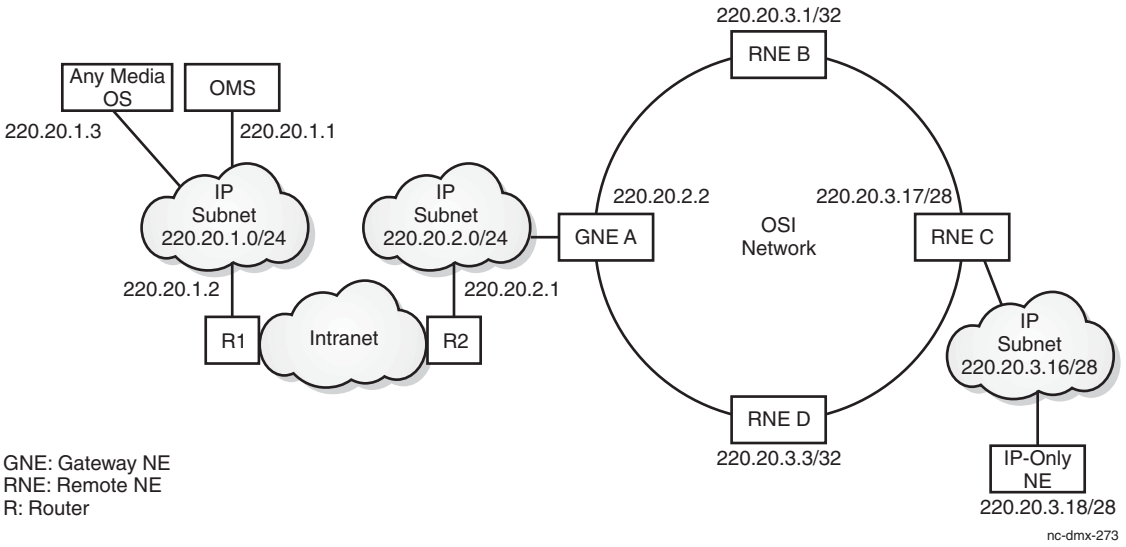
	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
GNE						
	220.20.2.2/24	LAN	-	local	no	20
	default	LAN	220.20.2.1	local	no	20
	220.20.1.1/32	LAN	220.20.2.1	manual	yes	20
	220.20.3.65/26	CLNP_ TUNNEL	<NSAP-P>	manual	no	20
	220.20.3.129/26	CLNP_ TUNNEL	<NSAP-X>	manual	no	20
	220.20.3.1/32	CLNP_ TUNNEL	<NSAP-B>	TAP	yes	20
	220.20.3.2/32	CLNP_ TUNNEL	<NSAP-C>	TAP	yes	20
	220.20.3.3/32	CLNP_ TUNNEL	<NSAP-D>	TAP	yes	20
RNE C						
	220.20.3.2/32	LAN	-	local	yes	20
	220.20.1.1/32	CLNP_ TUNNEL	<NSAP-A>	TAP	yes	20
	220.20.3.1/32	CLNP_ TUNNEL	<NSAP-B>	TAP	yes	20
	220.20.3.3/32	CLNP_ TUNNEL	<NSAP-D>	TAP	yes	20

	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
RNE P						
	220.20.3.65/32	LAN	-	local	yes	20
	220.20.1.1/32	CLNP_ TUNNEL	<NSAP-A>	manual	yes	20
	220.20.3.66/32	CLNP_ TUNNEL	<NSAP-Q>	TAP	yes	20
	220.20.3.67/32	CLNP_ TUNNEL	<NSAP-R>	TAP	yes	20
RNE X						
	220.20.3.129/32	LAN	-	local	yes	20
	220.20.1.1/32	CLNP_ TUNNEL	<NSAP-A>	manual	yes	20
	220.20.3.130/32	CLNP_ TUNNEL	<NSAP-Y>	TAP	yes	20
	220.20.3.131/32	CLNP_ TUNNEL	<NSAP-Z>	TAP	yes	20
RNE R						
	220.20.3.67/32	LAN	-	local	yes	20
	220.20.1.1/32	CLNP_ TUNNEL	<NSAP-A>	TAP	yes	20
	220.20.3.65/32	CLNP_ TUNNEL	<NSAP-P>	TAP	yes	20
	220.20.3.66/32	CLNP_ TUNNEL	<NSAP-Q>	TAP	yes	20

Example 4: IP NEs on the fringe

In this example, Figure 9-14, “IP NEs on the fringe” (p. 9-128), another extension of Example 2, IP routing is used to reach the IP-only NEs on the fringe of the OSI network, allowing termination of an IP connection at the IP-only host connected to RNE C on the same IP subnet. It can also be reached via additional routers).

Figure 9-14 IP NEs on the fringe



The RNE C is connected via its LAN port and is given a real IP address 220.20.3.17 (rather 220.20.3.2) which belongs to the subnet 220.20.3.16/28. The RNE C is still reachable via the IP address 220.20.3.0/24 provisioned at Router R1 as destination for the entire OSI subnet.

This also requires manual provisioning of the route to AnyMedia OS at the GNE and RNE C being provisioned as default router at the IP-only NE.

How to Provision Example 4

Use the following information along with the Step instructions for this procedure to provision the route illustrated in Example 4:

At ...	Provision ...
OMS	Provision its own IP address (220.20.1.1) and subnet mask (24 or 255.255.255.0) Provision router, R1 with IP address 220.20.1.2 as default router
AnyMedia OS	Provision its own IP address (220.20.1.3) and subnet mask (24 or 255.255.255.0) Provision router, R1 with IP address 220.20.1.2 as default router
Router R1	Provision IP addresses for its all interfaces - IP address (220.20.1.2) and subnet mask (24 or 255.255.255.0) - IP address for the interface connecting to intranet and the subnet mask of the directly attached subnet - If routers don't autoshare static routes, then Provision a static route to a subnet address which can cover maximum number of RNEs e.g. 220.20.3.0/24 as destination and GNE's IP address 220.20.2.2 as next-hop-address.

At ...	Provision ...
Router R2	Provision IP addresses for its all interfaces - IP address (220.20.2.1) and subnet mask (24 or 255.255.255.0) - IP address for the interface connecting to intranet and the subnet mask of the directly attached subnet Provision a static route to a subnet address which can cover maximum number of RNEs e.g. 220.20.3.0/24 as destination and GNE's IP address 220.20.2.2 as next-hop-address.
GNE	Provision its own IP address (220.20.2.2) and subnet mask (24 or 255.255.255.0) for the rear LAN port. Enable TCP/IP Function on the rear LAN port. Provision R2 as default router with IP address 220.20.2.1 Provision manual route to OMS which it would advertise within its own area. The manual route would have OMS IP address 220.20.1.1/32 as destination and router R2's IP address 220.20.2.1 as next-hop-address Ensure that TAP Advertise and TAP Learn are enabled. Provision a manual route to AnyMedia OS similar to OMS and IP address of AnyMedia OS, 220.20.1.3/24
RNE C	Provision its own IP address (220.20.3.17) and subnet mask (28 or 255.255.255.240) for the LAN port. Enable TCP/IP Function on the LAN port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled.
IP-only NE	Provision its own IP address (220.20.3.18) and subnet mask (28 or 255.255.255.240) Provision RNE C as its default router with IP address (220.20.3.17)

Use the following routing information at the OMS and Router to provision the route illustrated in Example 4:

	Destination	Gateway	Interface	Comments
OMS				
	220.20.1.1/24	-	lan	populated by stack
	default	220.20.1.2	lan	populated by stack
Router				
R1	220.20.1.2/24	-	lan	populated by stack

	Destination	Gateway	Interface	Comments
	220.20.3.0/24	220.20.2.2	lan	*1.* populated by OSPF (if static routes autoshare) *2.* manual (if static routes not autoshare e.g. in Cajun 550)
R2	220.20.2.1/24	-	lan	populated by stack
	220.20.3.0/24	220.20.2.2	lan	manual

Use the following routing information at the AnyMedia OS to provision the route illustrated in Example 4:

	Destination	Gateway	Interface	Comments
AnyMedia OS				
	220.20.1.3/24	-	lan	populated by stack
	default	220.20.1.2	lan	populated by stack

Use the following routing information at the GNE/RNE to provision the route illustrated in Example 4:

	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
GNE						
	220.20.2.2/24	LAN	-	local	no	20
	default	LAN	220.20.2.1	local	no	20
	220.20.1.1/32	LAN	220.20.2.1	manual	yes	20
	220.20.1.3/32	LAN	220.20.2.1	manual	yes	20
	220.20.3.1/32	CLNP_ TUNNEL	<NSAP-B>	TAP	yes	20
	220.20.3.2/32	CLNP_ TUNNEL	<NSAP-C>	TAP	yes	20
	220.20.3.3/32	CLNP_ TUNNEL	<NSAP-D>	TAP	yes	20

	Destination	Next Hop Port	Next Hop Address	Owner	TAP Advertisement	Cost
RNE C						
	220.20.3.17/28	LAN	-	local	yes	20
	220.20.3.18/28	LAN	-	local	no	20
	220.20.1.1/32	CLNP_ TUNNEL	<NSAP-A>	TAP	yes	20
	220.20.3.1/32	CLNP_ TUNNEL	<NSAP-B>	TAP	yes	20
	220.20.3.3/32	CLNP_ TUNNEL	<NSAP-D>	TAP	yes	20

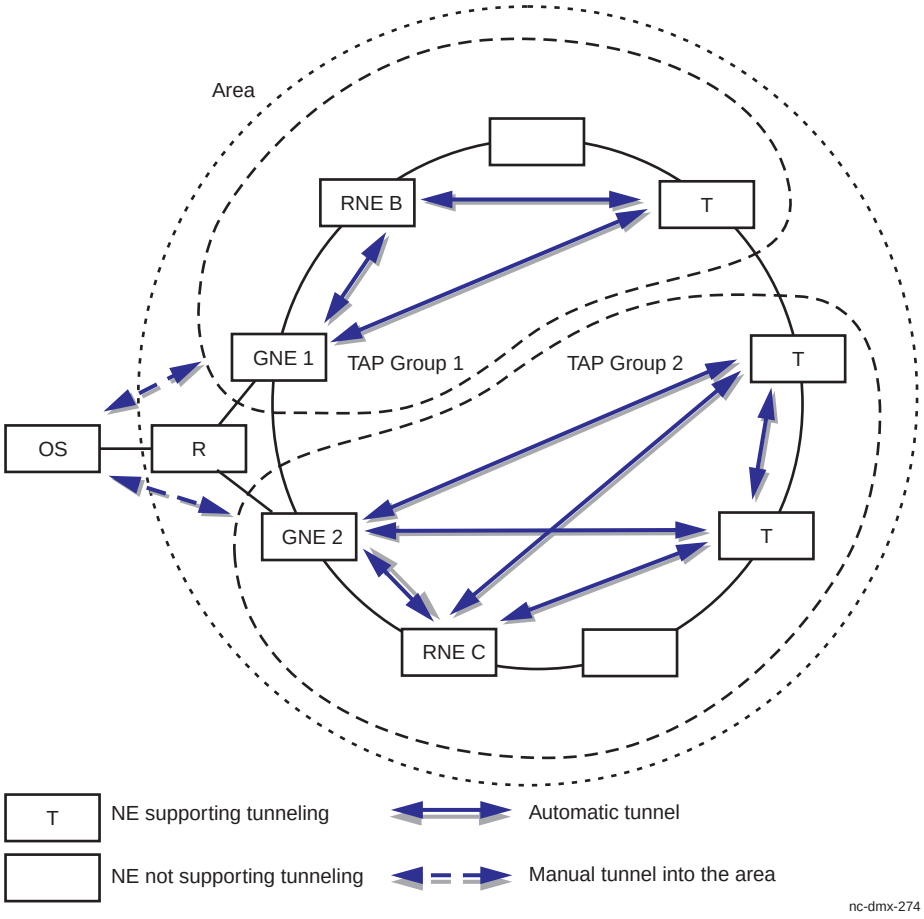
Use the following routing information at the IP-Only NE to provision the route illustrated in Example 4:

	Destination	Gateway	Interface	Comments
IP-Only NE				
	220.20.3.18/28	-	lan	populated by stack
	default	220.20.3.17	lan	populated by stack

Example 5: Multiple GNEs scenario

In this example, Figure 9-15, “Multiple GNEs scenario” (p. 9-132), a single area has many NEs and if TCP/IP Function is provisioned, the Tunnel Auto Provisioning (TAP) advertisement that would be exchanged would be significantly high and lot of such traffic would pass through GNE.

Figure 9-15 Multiple GNEs scenario



To avoid the overloading on the network and particularly on GNE, TAP Groups are defined. With this, TAP enabled NEs wouldn't listen to the advertisements from NEs outside their TAP groups and thus don't form tunnels with them or through them.

Setting up TAP groups necessitates two GNEs, each with one manual route entry to OS and advertise in their respective TAP groups.

How to Provision Example 5

Use the following information along with the Step instructions for this procedure to provision the route illustrated in Example 5:

At ...	Provision ...
OS	Provision its own IP address and subnet mask . Provision router as default router.

At ...	Provision ...
Router	Provision IP addresses for all interfaces. Provision 2 static routes (one to GNE 1 and one to GNE 2).
GNE 1	Provision its own IP address and subnet mask for the rear LAN port. Enable TCP/IP Function on the rear LAN port. Provision default router . Provision manual route entry to OS with TAP Group 1. Ensure that TAP Advertise and TAP Learn are enabled.
GNE 2	Provision its own IP address and subnet mask for the rear LAN port. Enable TCP/IP Function on the rear LAN port. Provision default router . Provision manual route entry to OS with TAP Group 2. Ensure that TAP Advertise and TAP Learn are enabled.
RNE B	Provision its own IP address and subnet mask for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled for TAP Group 1.
RNE C	Provision its own IP address and subnet mask for DCC port. Enable TCP/IP Function on the DCC port. Enable Advertising of its own local entry. Ensure that TAP Advertise and TAP Learn are enabled for TAP Group 2.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions identify the OS/FTP server, gateway network element, and remote network element.
4. Verify that the work instructions specify the required provisioning at each network element (for example, IP addresses and subnet masks).

5. If the FTP server is a local PC (*WaveStar*® CIT), verify that the PC's IP address and Subnet Mask parameters are provisioned and that a static route on the PC connects it to the remote NEs.
6. If the FTP server is a remote OS, verify that the remote OS' IP address and Subnet Mask parameters are provisioned and if the remote OS and GNE are in different subnetworks, verify that the Default Router IP address is provisioned.

Steps

Complete the following steps to add IP routes through the data communications channel (DCC) OSI-based network:

1 If the remote OS is a local PC, a static route on the PC must provide a path to the remote NEs. If packets are intended for the remote NE, then you must route to the gateway NE.

If the remote OS is a remote operations system, the static route must be entered on the router.

Example: If the OS is a local PC, from the MS-DOS prompt, enter **`route add 120.20.20.0 MASK 255.255.255.0 120.20.30.1`**. In this example 120.20.20.0 is the subnetwork address of the remote NE and 120.20.30.1 is the IP address of the gateway NE. The Subnet Mask of the OS and the Gateway is 255.255.255.0 while the Subnet Mask of the Remote NEs is 255.255.255.255.

2 If the remote OS and GNE are in different subnetworks, verify that the router in each subnetwork has IP addresses provisioned for all interfaces and that the static route, as described in Step 1, has been provisioned on the router.

3 Establish a login session to the GNE.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

4 At the GNE:

1. From the System View, select **Administration** → **Data Communications**. The *Data Communications* window opens.
2. Click on the **TCP/IP** tab.
3. In the *Data Communications* window, click on the **Port AID:** drop-down menu and select *LAN-1* or *LAN-2* according to the work instructions.
4. *Enable* the **TCP/IP Function**, and provision the **IP Address** and **IP Subnet Mask** parameters according to the work instructions.

5. If the remote OS and GNE are in different subnetworks, provision the **IP Default Router Address** parameter according to the work instructions.
6. Click **Apply**. A dialog box appears stating that executing this command resets the network element. Click **Yes** and the *WaveStar*® CIT disconnects from the network element.

   A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

   Important! If automatic synchronization is unsuccessful, the date and time must be reset manually.

   Reference: Procedure 7-10: "Set date and time" (p. 7-31).

5 Re-establish the log in session to the GNE.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

6 At the GNE:

1. From System View, select **Administration** → **Data Communications** The *Data Communications* window opens.
2. Click on the **IP Routing** tab.
3. In the *Data Communications* window, enable the **TAP Advertise** and **TAP Learn** parameters. Then provision the **TAP Group** parameter according to the work instructions. Click **Apply** and **Close**.

7 Log out of the GNE and log in to the remote NE.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

8 At the RNE:

1. From the System View, select **Administration** → **Data Communications**. The *Data Communications* window opens.
2. Click on the **TCP/IP** tab.
3. In the *Data Communications* window, click on the **Port AID:** drop-down menu and select *DCC-ALL*.

4. Enable **TCP/IP Function** parameter.
5. Provision the **IP Address** and **IP Subnet Mask** parameters according to the work instructions and click on **Apply**. A dialog box appears stating that executing this command resets the network element. Click **Yes** and the *WaveStar*® CIT disconnects from the network element.

   A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

   Important! If automatic synchronization is unsuccessful, the date and time must be reset manually.

   Reference: Procedure 7-10: "Set date and time" (p. 7-31).

9 Re-establish the log in session to the RNE.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

10 At the RNE:

1. From the System View, select **Administration** → **Data Communications**. The *Data Communications* window opens.
2. Click on the **IP Routing** tab.
3. In the *Data Communications* window, enable the **TAP Advertise** and **TAP Learn** parameters. Then provision the **TAP Group** parameter according to the work instructions. Click **Apply** and **Close**.

11 If required, repeat Step 7 through Step 10 at other RNEs.

END OF STEPS

Procedure 9-11: Establish low-speed 1+1 unprotected linear optical extension

Overview

Use this procedure to establish a low-speed 1+1 unprotected linear OC-3/12/48 optical extension.

Important! This procedure assumes that the low-speed 1+1 unprotected optical linear extension is established by interconnecting a OC-3/12/48 Function/Growth slot at the host Alcatel-Lucent 1665 DMX to a far-end node or a local testhead for test access tributaries.

Ignore all alarms until the procedure is complete.

Privilege level

You must log in as either a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

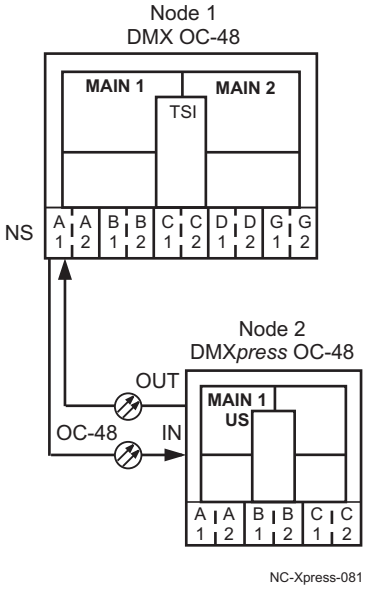
1. Refer to "Before you begin" (p. 9-2) and "Required equipment" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Verify that you have the necessary work instructions detailing the slots, circuit packs, ports, and network element parameters to be used for this procedure.
4. Verify that the network containing the host Alcatel-Lucent 1665 DMX node is established and operating properly.
5. Verify that the far-end node or local testhead being connected to the host Alcatel-Lucent 1665 DMX node has been equipped and is operating properly.

Steps

Complete the following steps to establish a low-speed 1+1 unprotected OC-3/12/48 optical extension.

1 Determine the network configuration using the work instructions and office records. Refer to the example in Figure 9-16, "Example of 1+1 unprotected optical linear extension" (p. 9-138).

Figure 9-16 Example of 1+1 unprotected optical linear extension



2 **Important!** Two or more shelves in the same network cannot have the same TID.

Using the work instructions and office records, verify that no duplicate TID settings exist between the host Alcatel-Lucent 1665 DMX and the far-end node or local testhead. If duplicate TID settings exist, determine new settings and at each site with duplicate TID settings, select **Administration** → **Set TID** from the System View menu, and enter new TID settings.

Reference: Procedure 7-11: “Set/change system TID” (p. 7-36)

3 If required, modify the network service access point (NSAP) address and/or enable Level 2 routing capabilities at the host Alcatel-Lucent 1665 DMX and the far-end node or local testhead.

Reference: Procedure 7-13: “Provision network layer 3 parameters” (p. 7-39)

4 At the host Alcatel-Lucent 1665 DMX node, verify/install the required OLIU circuit packs and/or pluggable transmission modules in the Function Group slot (A1, B1, C1, D1, or G1) being used for access according to the work instructions.

Important! If the work instructions or office records do not specify OLIU types, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for a description of OLIU circuit packs/pluggable transmission modules and applications. Optical line power measurements and/or office records must be used to verify that the span length can be supported.

The companion Function/Growth slot at the host Alcatel-Lucent 1665 DMX nodes may be:

- unequipped (no protection OLIU circuit pack installed)
- equipped with a protection OLIU circuit pack and companion port with no cable connected
- equipped with a protection OLIU circuit pack and the companion socket is unequipped.
- equipped with the same type 0x1 compatible circuit pack and companion port with no cable connected (when Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs are in the Main slots)
- equipped with the same type 0x1 compatible circuit pack and the companion socket is unequipped (when Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs are in the Main slots)

Reference:

- Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

5 **Important!** If OSI over DCC is enabled for ports, an `inconsistent DCC values` alarm is reported when the ports are looped back.

If required at the host Alcatel-Lucent 1665 DMX node, clear the `inconsistent DCC values` alarm by disabling OSI over DCC for the required ports. From the System View menu, select **Configuration** → **DCC Terminations** and disable **OSI Over DCC** for the required DCC ports.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

6 **Important!** It is recommended that the port Application parameter be provisioned *1+1* at both ends of the system.

For test access tributaries, the port Application parameter must be provisioned *1+1*.

From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**. Select the required ports and provision the required port parameters according to the work instructions.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

7 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **Configuration** → **Equipment**, if not already open. Select the system (AID=system), then click **Select** at the bottom of the window.

If required, provision the *1+1 Protection Priority* (1+1 applications only) and *Wait To Rename* (Optimized 1+1 applications only) parameters. Click **Apply** if changes were made, then click **Yes** to the warning message to make your changes. Click **Close** to exit.

8 At the host Alcatel-Lucent 1665 DMX node, verify that the low-speed OC-n ports were provisioned correctly using the **View** → **Equipment** command.

9 **Important!** If OSI over DCC is enabled, the LAPD Role parameter must be provisioned differently at each end of an optical span. For example, if the LAPD Role parameter is provisioned to user-side at one end of an optical span, then the LAPD Role parameter must be provisioned network-side at the other end of the optical span.

For test access tributaries, OSI over DCC and IP over DCC must be *disabled*.

From the System View menu, select **Configuration** → **DCC Terminations** and provision the DCC terminations for the required DCC ports according to the work instructions.

Result: If OSI over DCC is enabled, an `inconsistent DCC values` alarm will occur if the OC-n ports are looped back.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

10 From the System View menu at the host Alcatel-Lucent 1665 DMX node, select **View** → **DCC Terminations** and verify that the DCC terminations were provisioned correctly.

11 At the far-end node or local testhead that is connecting to the host Alcatel-Lucent 1665 DMX node, provision the required ports, DCC terminations, synchronization, and remote NE status functions according to the work instructions.

Refer to the other product's documentation to perform the required provisioning.

12 Connect the optical fibers and verify the integrity of the optical span being installed.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

13 Perform end-to-end optical line test.

Reference: Procedure 14-8: “Perform end-to-end optical line test on Function OLIUs” (p. 14-66)

14 Click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 **Important!** Establishing service requires that the proper slots in each terminating node be properly equipped with the correct circuit pack(s) for the type of service being established. It also requires numerous cross-connections in each of the nodes representing the path of the required service. Additionally, transmission tests should be performed to verify the continuity and quality of the established circuit.

The unprotected linear optical extension is now ready for initial service or a test access session to be established.

Reference:

- Chapter 10, “TDM service provisioning procedures”
- Chapter 11, “Ethernet/Data network provisioning procedures”
- Procedure 14-23: “Establish external test access session in the MON(E or EF) mode” (p. 14-117)
- Procedure 14-24: “Establish external test access session in the SPLT(E or EF) mode” (p. 14-126)

END OF STEPS

Procedure 9-12: Establish DWDM network

Overview

Use this procedure to establish an Alcatel-Lucent 1665 DMX DWDM:

- point-to-point network
- linear network
- ring network.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs and software has been installed. If not, refer to Chapter 5, "Node turnup procedures".

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to establish an end-to-end Alcatel-Lucent 1665 DMX DWDM network.

1 Determine the DWDM network configuration to be established using the work instructions and office records.

Reference: "DWDM network examples" (p. 9-143)

2 **Important!** The network element TID (target identifier) must be unique in the network.

Select **Administration** → **View NE Administration** to access the NE administrative parameters. Verify that the *NE Parameters* and *NSAP* are provisioned correctly using the work instruction and/or office records and click **Close**.

If provisioning changes are required, refer to the appropriate procedure(s) in Chapter 7, "System administration procedures".

Repeat this step at each node in the network.

3

If establishing a DWDM...	Then...
point-to-point network,	Proceed to Procedure 9-12.1: "Establish DWDM point-to-point network" (p. 9-145).
linear network,	Proceed to Procedure 9-12.2: "Establish DWDM linear network" (p. 9-147).
ring network,	Proceed to Procedure 9-12.3: "Establish DWDM ring network" (p. 9-151).

END OF STEPS

DWDM network examples

Figure 9-17 DWDM point-to-point network example

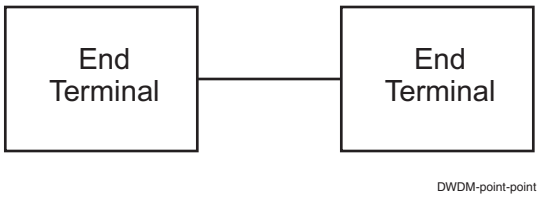


Figure 9-18 DWDM linear network example

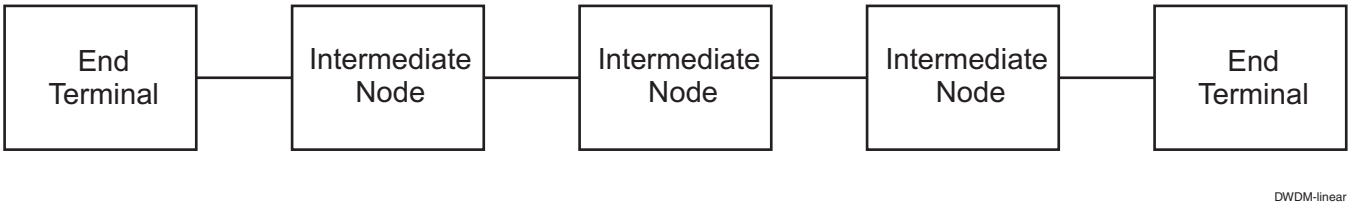
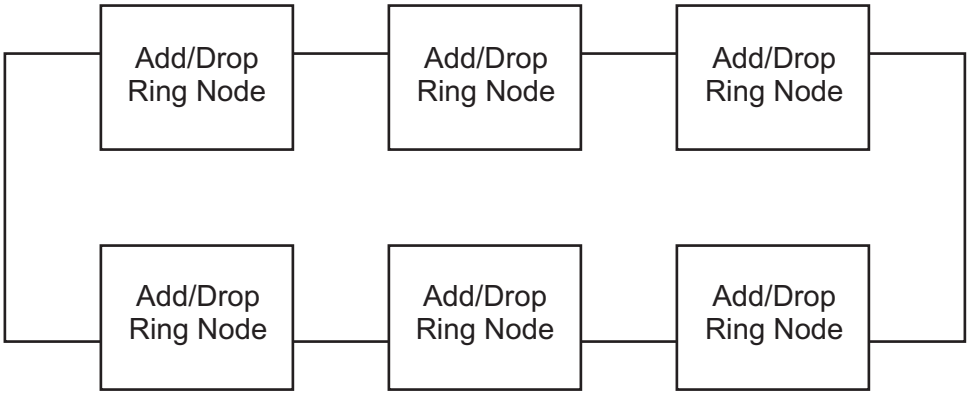


Figure 9-19 DWDM ring network example



Procedure 9-12.1: Establish DWDM point-to-point network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-12: "Establish DWDM network" (p. 9-142).

Steps

Important! This procedure assumes that the DWDM point-to-point network is established by interconnecting two Alcatel-Lucent 1665 DMX equipped as DWDM End Terminal nodes. However, the Alcatel-Lucent 1665 DMX may also be connected in a DWDM point-to-point network with an Alcatel-Lucent 1850 TSS-100 or Alcatel-Lucent 1850 TSS-320 equipped as a DWDM End Terminal node.

If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.

If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) User Operations Guide, 365-372-301*, as required, when performing this procedure.

This procedure assumes that the near-end node is an Alcatel-Lucent 1665 DMX and the far-end node is either an Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs for DWDM End Terminal nodes and software has been installed. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a DWDM point-to-point network.

1 From the System View menu at the near-end node, select **Configuration** → **Equipment** to access the required OMD circuit pack and provision the OTS port parameters according to the work instructions.

Reference: Procedure 4-26: "Provision optical transport signal (OTS) port" (p. 4-135)

2 Select **View** → **Equipment** to access the required OMD circuit pack and verify that the OTS port was provisioned correctly.

3 At the near-end node, provision the required synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

4 At the far-end node, provision the required OTS port and synchronization functions according to the work instructions.

If the far-end node is an...	Then...
Alcatel-Lucent 1665 DMX,	Repeat Step 1 through Step 3.
Alcatel-Lucent 1665 DMXtend	Refer to the other product's documentation to provision the required OTS port and synchronization functions.

5 Connect the optical fibers and verify the integrity of the DWDM optical span being established.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

6 Perform end-to-end optical line test.

Reference: Procedure 14-37: "Perform end-to-end optical line test on DWDM line" (p. 14-169)

7 At each node in the point-to-point network, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

8 The DWDM point-to-point network is now ready for optical channels to be added.

Reference: Procedure 10-15: "Add optical channel (OCH) to DWDM network" (p. 10-92)

END OF STEPS

Procedure 9-12.2: Establish DWDM linear network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-12: "Establish DWDM network" (p. 9-142).

Steps

Important! This procedure assumes that the DWDM linear network is established by interconnecting one Alcatel-Lucent 1665 DMX equipped as DWDM End Terminal node at each end with Alcatel-Lucent 1665 DMX equipped as DWDM Add/Drop Ring nodes at intermediate nodes.

However, the Alcatel-Lucent 1665 DMX may also be connected in a DWDM linear network with Alcatel-Lucent 1665 DMXtend equipped as an End Terminal or Add/Drop Ring node.

If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.

If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) User Operations Guide, 365-372-301*, as required, when performing this procedure.

Nodes are provisioned and optical spans are established individually from one end of the linear network to the opposite end starting with an Alcatel-Lucent 1665 DMX End Terminal node designated as the starting node. Continue through the linear network in the same direction until all nodes are provisioned.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs for End Terminal or Add/Drop Ring nodes and software has been installed. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a DWDM linear network.

1 From the System View menu at the End Terminal designated as the starting node, select **Configuration** → **Equipment** to access the required OMD circuit pack and provision the OTS port parameters according to the work instructions.

Reference: Procedure 4-26: "Provision optical transport signal (OTS) port" (p. 4-135)

2 Select **View** → **Equipment** to access the required OMD circuit pack and verify that the OTS port was provisioned correctly.

3 At the starting node, provision the required synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

4 At the adjacent Add/Drop Ring node, provision the required OTS ports and synchronization functions according to the work instructions.

If the Add/Drop Ring node is an...	Then...
Alcatel-Lucent 1665 DMX	Continue with Step 5.
Alcatel-Lucent 1665 DMXtend	Refer to the other product's documentation to provision the required OTS ports and synchronization functions. Then proceed to Step 10.

5 From the System View menu at the Add/Drop Ring node, select **Configuration** → **Equipment** to access the OMD circuit pack in Function slot 1 and provision the OTS port parameters according to the work instructions.

Repeat this step for the companion OMD circuit pack in Function Slot 2.

Reference: Procedure 4-26: "Provision optical transport signal (OTS) port" (p. 4-135)

6 Select **View** → **Equipment** to access the required OMD circuit packs and verify that the OTS ports were provisioned correctly.

7 **Important!** The Optical Channel (OCH) ports of the OMD circuit packs within a Function Group are required to be pre-equipped with pass-through fiber jumpers. This minimizes the installation time of pass-through connections when a service is established. Constant travel to pass-through nodes is avoided when a service is added.

Verify that the pass-through fiber jumpers have been installed that connect the Optical Channel (OCH) ports of the OMD circuit packs in the Function Group.

8 **Important!** OCH cross-connections to/from an OCH port are used to inform the network element about manual fiber connections. This allows the network element to enable alarm reporting and variable optical attenuators. The variable optical attenuators are enabled only when an OCH port is the destination of an OCH cross-connection.

Select **View** → **OCH Cross-Connections** to verify that the required pass-through OCH cross-connections exist.

If required, select **Configuration** → **OCH Cross-Connections** to access the *OCH Cross-Connection Wizard* and provision the required pass-through OCH cross-connections.

9 At the Add/Drop Ring node, provision the required synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

10

If the next adjacent node is...	Then...
another Add/Drop Ring node,	Repeat Step 4 through Step 10.
the other End Terminal node,	Continue with Step 11.

11 At the other End Terminal node, provision the required OTS port and synchronization functions according to the work instructions.

If the other End Terminal node is an...	Then...
Alcatel-Lucent 1665 DMX,	Repeat Step 1 through Step 3.
Alcatel-Lucent 1665 DMXtend,	Refer to the other product's documentation to provision the required OTS port and synchronization functions.

12 Beginning with the starting DWDM optical span, connect the optical fibers between the OTS ports and verify the integrity of the OTS line being established.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

13 Perform end-to-end optical line test.

Reference: Procedure 14-37: "Perform end-to-end optical line test on DWDM line" (p. 14-169)

14 Continue through the linear network until all nodes are connected.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX,	Repeat Step 12 and Step 13 to connect and test the optical span.
Alcatel-Lucent 1665 DMXtend,	Refer to the other product's documentation to connect and test the optical span.

15 At each node in the linear network, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

16 The DWDM linear network is now ready for optical channels to be added.

Reference: Procedure 10-15: "Add optical channel (OCH) to DWDM network" (p. 10-92)

END OF STEPS

Procedure 9-12.3: Establish DWDM ring network

Important! This is *not* a standalone procedure. Perform this procedure only as directed by Procedure 9-12: "Establish DWDM network" (p. 9-142).

Steps

Important! This procedure assumes that the DWDM ring network is established by interconnecting Alcatel-Lucent 1665 DMX equipped as DWDM Add/Drop Ring nodes. However, the Alcatel-Lucent 1665 DMX may also be interconnected in a DWDM ring network with and Alcatel-Lucent 1665 DMXtend equipped as an Add/Drop Ring node.

If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, as required, when performing this procedure.

If connecting to an Alcatel-Lucent 1665 DMXtend, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) User Operations Guide, 365-372-301*, as required, when performing this procedure.

Nodes are provisioned and optical spans are established individually around the ring starting with an Alcatel-Lucent 1665 DMX Add/Drop Ring node designated as the starting node. Continue through the ring network in the same direction until all nodes are provisioned.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required circuit packs for Add/Drop Ring nodes and software has been installed. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Complete the following steps to establish a DWDM ring network.

1 From the System View menu at an Add/Drop Ring node designated as the starting node, select **Configuration** → **Equipment** to access the OMD circuit pack in Function slot 1 and provision the OTS port parameters according to the work instructions.

Repeat this step for the companion OMD circuit pack in Function Slot 2.

Reference: Procedure 4-26: "Provision optical transport signal (OTS) port" (p. 4-135)

2 Select **View** → **Equipment** to access the required OMD circuit packs and verify that the OTS ports were provisioned correctly.

3 **Important!** The Optical Channel (OCH) ports of the OMD circuit packs within a Function Group are required to be pre-equipped with pass-through fiber jumpers. This minimizes the installation time of pass-through connections when a service is established. Constant travel to pass-through nodes is avoided when a service is added.

Verify that the pass-through fiber jumpers have been installed that connect the Optical Channel (OCH) ports of the OMD circuit packs in the Function Group.

4 **Important!** OCH cross-connections to/from an OCH port are used to inform the network element about manual fiber connections. This allows the network element to enable alarm reporting and variable optical attenuators. The variable optical attenuators are enabled only when an OCH port is the destination of an OCH cross-connection.

Select **View** → **OCH Cross-Connections** to verify that the required pass-through OCH cross-connections exist.

If required, select **Configuration** → **OCH Cross-Connections** to access the *OCH Cross-Connection Wizard* and provision the required pass-through OCH cross-connections.

5 At the Add/Drop Ring node, provision the required synchronization functions (for example, timing mode) according to work instructions.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

6 At each Add/Drop Ring node in the ring network, provision the required OTS ports and synchronization functions according to the work instructions.

If the Add/Drop Ring node is an...	Then...
Alcatel-Lucent 1665 DMX,	Repeat Step 1 through Step 5 to provision the OTS ports and synchronization functions according to the work instructions.
Alcatel-Lucent 1665 DMXtend,	Refer to the other product's documentation to provision the required OTS ports and synchronization functions.

7 Beginning with the starting DWDM optical span, connect the optical fibers between the OTS ports and verify the integrity of the OTS line being established.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

8 Perform end-to-end optical line test.

Reference: Procedure 14-37: “Perform end-to-end optical line test on DWDM line” (p. 14-169)

9 Continue around the ring network until all nodes are connected.

If the node is an...	Then...
Alcatel-Lucent 1665 DMX,	Repeat Step 7 and Step 8 to connect and test the optical span.
Alcatel-Lucent 1665 DMXtend,	Refer to the other product's documentation to connect and test the optical span.

10 At each node in the ring network, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

11 The DWDM ring network is now ready for optical channels to be added.

Reference: Procedure 10-15: “Add optical channel (OCH) to DWDM network” (p. 10-92)

END OF STEPS

Procedure 9-13: Establish external network-to-network interface (E-NNI)

Overview

The basic functions of a control plane for an Automatically Switched Optical Network (ASON) are signaling and routing. Signaling is used to create, delete and maintain end-to-end connections. Routing selects the most appropriate path(s). See Figure 9-20, "Control plane network with E-NNI connecting to an I-NNI capable core" (p. 9-156).

The data communications network for transferring control plane information (signaling and routing messages) is called the Signaling Communications Network (SCN). Various logical interfaces (reference points) partition the control plane interfaces into (1) between a user (client) and a service provider (transport network) control domain, named the User Network Interface (UNI), (2) between control domains, named as the External Network-to-Network Interface (ENNI), and (3), within a control domain, named as the Internal Network-to-Network Interface (I-NNI).

Alcatel-Lucent 1665 DMX ports can be configured as Traditional, Edge or ENNI.

An E-NNI port is a Network-Network Interface port connected to another E-NNI port in a peer network element in a different domain of the switched network. E-NNI ports run a standardized signaling and routing protocol for the purpose of interworking between control domains. Alcatel-Lucent 1665 DMX supports the control plane with E-NNI over the inter-domain links for single node access domain configurations. Allowable ENNI ports are 0x1 and 1+1 ports on the LNW55, LNW59, LNW62 and LNW82.

Edge ports work as add/drop ports of end-to-end connections. Allowable Edge ports are DS3/EC1 ports, OC-n ports (all applications), and Private Line VCG ports.

Traditional ports are ports that are not visible to the control plane. Cross-connections are provisioned using existing TL1 commands.

This procedure assumes that the network system has already been established with all nodes of the network properly equipped and operating for standard SONET transmission.

Important! The port application for the inter-domain E-NNI links must be either 0x1 unprotected or linear 1+1. E-NNI is supported only on the optical ports of the following circuit packs due to the line DCC availability: LNW55, LNW59, LNW62 and LNW82.

Provisioning within the core domain for the I-NNI portion of the network is the responsibility of that domain.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

   Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelves and associated network connections have been properly equipped and tested. If the Alcatel-Lucent 1665 DMX shelf has not been properly equipped, refer to Chapter 5, "Node turnup procedures". If the network has not been properly configured, refer to Chapter 9, "Network configuration procedures" and to other product documentation, as required.

Steps

Complete the following steps to establish an Alcatel-Lucent 1665 DMX External Network-to-Network Interface (ENNI) and related connections.

1 Verify that the entire transport network has been properly established with all the optical transport connections, circuit packs and necessary port provisioning, excluding E-NNI related provisioning.

2 Perform the following tasks:

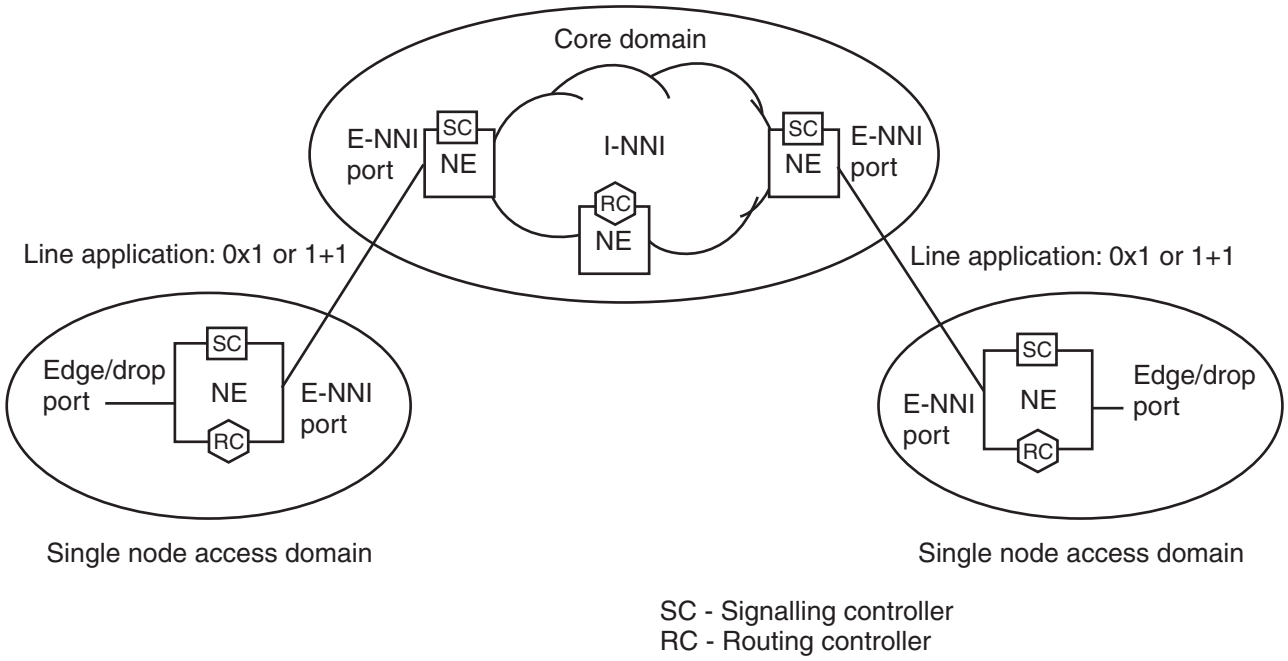
1. Procedure 9-13.1: "Provision system level node parameters" (p. 9-157)
2. Procedure 9-13.2: "Provision Edge port control plane parameters" (p. 9-159)
3. Procedure 9-13.3: "Provision ENNI port control plane parameters" (p. 9-162)
4. Procedure 9-13.4: "Configure Signaling Communication Network (SCN)" (p. 9-166)

3 If required, create a control plane network connection after the network has been established.

Reference: Procedure 9-13.5: "Create control plane network connections" (p. 9-169)

END OF STEPS

Figure 9-20 Control plane network with E-NNI connecting to an I-NNI capable core



Procedure 9-13.1: Provision system level node parameters

Overview

Use this procedure to view and provision the E-NNI system level edge node parameters at each of the Alcatel-Lucent 1665 DMX edge nodes.

The following parameters cannot be provisioned if there is an existing control plane connection on any Edge or ENNI port, or bandwidth on an Edge or ENNI port is reserved due to a pending connection:

- Node ID (nodeid)
- Signaling protocol controller identifier (spcid)
- Routing Area (RA) ID (raid)
- Routing Controller (RC) ID (rcid)
- Remote Routing Controller (RC) ID (remrcid)

Steps

Complete the following steps to configure system level node parameters.

1 From the System View menu, select **Configuration** → **Equipment**. Enter AID **`system`** (highlight **DMX** then click **Select**.

2 Select the **ENNI** tab. From your work instructions, provision the parameters as required. Click **Apply** to make your changes, then click **Close** to exit.

Parameters:

- **Node ID** (**`nodeid`**) — Identifies the local node in the transport topology. It has an IPv4 address format which consists of four dot-separated decimal numbers ranging from 0 to 255. The initial value is 0.0.0.0, indicating an unprovisioned value. The value of 0.0.0.0 can be used to delete a previously provisioned Node ID. TL1 command: **`ent-node-enni`**.
- **Signaling Protocol Controller ID** (**`spcid`**) — Identifies the local signaling protocol controller that maintains signaling relationships with its downstream or upstream E-NNI peer. It has an IPv4 address format which consists of four dot-separated decimal numbers ranging from 0 to 255. The initial value is 0.0.0.0, indicating an unprovisioned value. The value of 0.0.0.0 can be used to delete a previously provisioned signaling protocol controller identifier. TL1 command: **`ent-node-enni`**.

- **SCN IP Address** (**scnipaddr**) — An IPv4 address for the local node, which is used as either signaling protocol controller SCN address, routing controller SCN address or both. It has an IPv4 address format which consists of four dot-separated decimal numbers ranging from 0 to 255. The initial value is 0.0.0.0, indicating an unprovisioned value. The value of 0.0.0.0 can be used to delete a previously provisioned SCN IP address. TL1 command: **ent-node-enni**.
- **Routing Controller** (**l1routing**) — Enables/disables the local node as E-NNI Level 1 Routing Controller. Valid values are ENABLED or DISABLED. The initial value is DISABLED. To enable a node as Level 1 Routing Controller, the Routing Controller ID, Routing Area ID, and SCN IP Address have to be provisioned first. TL1 command: **ent-node-enni**.
- **Routing Controller ID** (**rcid**) — Identifier for the local E-NNI Level 1 RC, which is used as OSPF (Open Shortest Path First) Router ID. It has an IPv4 address format which consists of four dot-separated decimal numbers ranging from 0 to 255. The initial value is 0.0.0.0, indicating an unprovisioned value. The value of 0.0.0.0 can be used to delete a previously provisioned RC ID. TL1 command: **ent-node-enni**.
- **Routing Area ID** (**raid**) — An OSPF routing area for the local E-NNI Level 1 RC. It has an IPv4 address format which consists of four dot-separated decimal numbers ranging from 0 to 255. The initial value is 0.0.0.0, indicating an unprovisioned value. The value of 0.0.0.0 can be used to delete a previously routing area ID. TL1 command: **ent-node-enni**.
- **Remote Routing Controller ID** (**remrcid**) — The routing controller ID of neighboring routing controller. It has an IPv4 address format which consists of four dot separated decimal numbers ranging from 0 to 255. The value 0.0.0.0 is invalid. More than one neighbor can be provisioned by executing the command multiple times. A maximum of 20 neighbors can be provisioned. TL1 command: **ent-rc-neighbor**.
- **Remote RC SCN IP Address** (**remrcscn**) — Remote Routing Controller SCN IP address. The SCN IP address of a neighboring routing controller. It has an IPv4 address format which consists of four dot-separated decimal numbers ranging from 0 to 255. The value 0.0.0.0 is invalid. When an existing remote RC ID, but different remote RC SCN IP address is entered, the command treats it as a modification to the remote RC SCN IP address. TL1 command: **ent-rc-neighbor**.

END OF STEPS

Procedure 9-13.2: Provision Edge port control plane parameters

Overview

Use this procedure to provision the Edge port control plane parameters.

Other port parameters may need to be provisioned first before the control plane parameters. Refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures".

Requests to change Port Class from Traditional to Edge are denied if any of the following conditions are true.

- There is a loopback on the port.
- There is a test access connection on the port.
- The port is not a DS3, EC1, VCG or OC-n port.
- The Node ID (nodeid) has not been provisioned.
- The Edge port parameters (TNA Address Type, TNA Address, Logical Port ID) are not provisioned.

Requests to change Port Class from ENNI to Edge are denied. ENNI ports can only be changed to Traditional ports.

Provisioning restrictions on Edge ports:

- The following parameters cannot be provisioned if there is an existing control plane connection on the port or bandwidth on the port is reserved due to a pending connection:
  - TNA type (tnatype)
  - TNA (tna)
  - Logical port identifier (logportid)
- Test access connections are not allowed
- Loopbacks are only allowed when portcontrol=LOCKOUT

Steps

Complete the following steps to provision the Edge port control plane parameters.

1 Use the **`ent-cport-rr`** TL1 command to provision the parameters, or select **Configuration** → **Equipment** from the System View menu. Select (highlight) the port being provisioned, then click **Select**.

2 Click the **Control Plane** tab. Select **`Edge`** as the **Port Class** for the port being provisioned.

The port class selects the role of the port.

- **Traditional** — Traditional port (not a control plane port). Connections on Traditional ports can only be provisioned with **ent/dlt-crs**.
- **ENNI** — Control plane ENNI port. Connections on ENNI ports can only be provisioned with **ent/dlt-conn**.
- **Edge** — Control plane EDGE/Drop port. Connections on EDGE ports can be provisioned with **ent/dlt-conn** and **ent/dlt-crs**.

3 Provision Edge port parameters from your work instructions. Refer to Table 9-1, "ENT-CPORT-RR Edge port parameters" (p. 9-160).

END OF STEPS

Edge port parameters

Table 9-1, "ENT-CPORT-RR Edge port parameters" (p. 9-160) lists the provisionable parameters for an Edge port:

Table 9-1 ENT-CPORT-RR Edge port parameters

Parameter	Description
tnatype	**TNA Address Type**. TNA (Transport Network Assigned) Address Type may have one of the following values: • IPv4 — An IPv4 formatted Source TNA consisting of four dot-separated integers ranging from 0 to 255, for example: 220.10.10.10. • IPv6 — An IPv6 formatted Source TNA consisting of 8 dash-separated 4-digit hexadecimal numbers. For example, fedc-0000-0000-76b4-417a-1080-3210-1111. • NSAP — An NSAP formatted Source TNA consisting of a 20- byte (40 hexadecimal digits) string, for example: 39840f80000000000000000000008006a067197aa.
tna	**TNA Address**. Transport Network Assigned Address. An address assigned to endpoints of the connections by the transport service provider. The same TNA address can be assigned to multiple ports terminating on the same node. It is a required parameter when changing port class to EDGE.
logportid	**Logical Port ID**. Logical Port Identifier is an integer that identifies the local logical port. It is a required parameter when changing portclass to EDGE or ENNI. Value is an integer in the range from 1 to 4294967295.

Table 9-1 ENT-CPORT-RR Edge port parameters (continued)

Parameter	Description
portcontrol	**Port Control**. Port control specifies whether or not a control plane port supports additional control plane connections. Values: • NORMAL — Port is allowed to support control plane connections. This is the initial value if portcontrol is not specified when changing portclass to EDGE or ENNI. • LOCKOUT — Port is prohibited from supporting additional control plane connections. Removal of connections is supported.

Procedure 9-13.3: Provision ENNI port control plane parameters

Overview

Use this procedure to provision the ENNI port control plane parameters.

Other port parameters may need to be provisioned first before the control plane parameters. Refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures".

Requests to change Port Class from Traditional to ENNI are denied if any of the following conditions are true:

- There is a loopback on the port.
- There are cross-connections on the port
- There is a test access connection on the port.
- The port is not a 0x1 or 1+1 port.
- The following node level parameters have not been provisioned (still set to their initial value):
  - Node ID (nodeid)
  - SCN IP Address (scnipaddr)
  - Signalling Protocol Controller ID (spcid)
- The ENNI port parameters are not provisioned.

Requests to change Port Class from Edge to ENNI are denied. Edge ports can only be changed to Traditional ports.

Provisioning restrictions on ENNI ports:

- The following parameters cannot be provisioned if there is an existing connection on the port or bandwidth on the port is reserved due to a pending connection:
  - Link local identifier (logportid)
  - Link remote identifier (linkremid)
  - Remote node ID (remnid)
  - Remote signaling protocol controller identifier (remspcid)
  - Remote routing controller identifier (remrcid)
- Test access connections are not allowed
- Loopbacks are only allowed when portcontrol=LOCKOUT

Steps

Complete the following steps to provision the ENNI port control plane parameters.

1 Use the **ent-cport-rr** TL1 command to provision the parameters, or select **Configuration** → **Equipment** from the System View menu. Select (highlight) the port being provisioned, then click **Select**.

2 Click the **Control Plane** tab. Select **ENNI** as the **Port Class** for the port being provisioned.

The port class selects the role of the port.

- **Traditional** — Traditional port (not a control plane port). Connections on TRADITIONAL ports can only be provisioned with **ent**/**dlt-crs**.
- **ENNI** — Control plane ENNI port. Connections on ENNI ports can only be provisioned with **ent**/**dlt-conn**.
- **Edge** — Control plane EDGE/Drop port. Connections on EDGE ports can be provisioned with **ent**/**dlt-conn** and **ent**/**dlt-crs**.

3 Provision ENNI port parameters from your work instructions. Refer to Table 9-2, "ENT-CPORT-RR ENNI port parameters" (p. 9-163).

END OF STEPS

ENNI port parameters

Table 9-2, "ENT-CPORT-RR ENNI port parameters" (p. 9-163) lists the provisionable parameters for an Edge port:

Table 9-2 ENT-CPORT-RR ENNI port parameters

Parameter	Description
Local Parameters	
linkmetric	**Link Metric/Cost**. Linkmetric specifies the link cost for traffic engineering purposes. Its value is used to indicate the relative desirability of a particular link over another during path selection/computation procedures. A lower value indicates a higher desirability. Value is an integer in the range from 1 to 65535. One (1) is the initial value if linkmetric is not specified when changing portclass to ENNI.

Table 9-2 ENT-CPORT-RR ENNI port parameters (continued)

Parameter	Description
logportid	**Logical Port ID**. Logical Port Identifies an integer that identifies the local logical port. It is a required parameter when changing portclass to EDGE or ENNI. Value is an integer in the range from 1 to 4294967295.
portcontrol	**Port Control**. Port control specifies whether or not a control plane port supports additional control plane connections. Values: • NORMAL — Port is allowed to support control plane connections. This is the initial value if portcontrol is not specified when changing portclass to EDGE or ENNI. • LOCKOUT — Port is prohibited from supporting additional control plane connections. Removal of connections is supported.
Remote Parameters	
remtid	**Remote TID**. Remote Node Target Identifier is the TID of the node to which the downstream ENNI port belongs. It is a required parameter when changing portclass to ENNI.
remnid	**Remote Node ID**. Remote Node Identifier is an IPv4 formatted identifier of the remote node, consisting of four dot-separated integers ranging from 0 to 255. For example, 10.10.10.10. It is a required parameter when changing portclass to ENNI.
remlogportid	**Remote Logical Port ID**. Remote Logical Port Identifier is an integer that identifies the remote port at the other end of the link. It is a required parameter when changing portclass to ENNI. Value is an integer in the range from 1 to 4294967295.
remrcid	**Remote Routing Controller ID**. Remote Routing Controller Identifier is an IPv4 formatted identifier of the remote routing protocol controller, consisting of four dot-separated integers ranging from 0 to 255. For example, 10.10.10.10. It is a required parameter when changing portclass to ENNI.
remspcid	**Remote Signaling Protocol Controller ID**. Remote Signaling Protocol Controller Identifier is an IPv4 formatted identifier of the remote signaling protocol controller, consisting of four dot-separated integers ranging from 0 to 255. For example, 220.10.10.10. It is a required parameter when changing portclass to ENNI.

Table 9-2 ENT-CPORT-RR ENNI port parameters (continued)

Parameter	Description
remspcscn	**Remote Signaling Protocol Controller SCN Address**. Remote Signaling Protocol Controller SCN Address is an IPv4 formatted SCN address of the remote signaling protocol controller, consisting of four dot-separated integers ranging from 0 to 255. For example, 220.10.10.10. It is a required parameter when changing portclass to ENNI.

Procedure 9-13.4: Configure Signaling Communication Network (SCN)

Overview

Use this procedure to configure/provision the Signaling Communication Network (SCN) parameters. The SCN configuration consists of static IP routing parameters, and line DCC and LAN-3 parameters.

The SCN is a data communications network for transport of control plane signaling and routing messages between network elements (NEs). The SCN is an IP-based network which provides control channels between the upstream and downstream E-NNI nodes either over DCC or over LAN through an external IP network. Alcatel-Lucent 1665 DMX supports both LAN (LAN-3 [J18 DLAN]) and DCC (Line DCC) as the physical interfaces of SCN control channels.

The IP forwarding between peers of signaling controllers or routing controllers is supported by static routing for inter-domain forwarding.

Important! The system SCN IP Address must be provisioned first before performing this procedure. Use the **`ent-node`** TL1 command or refer to Procedure 9-13.1: “Provision system level node parameters” (p. 9-157) to provision the SCN IP Address (scnipaddr).

When IP over line DCC is enabled for a port or multiple ports, it is not required to allocate an IP address to each port. The enabled IP over line DCC interfaces are called unnumbered interfaces. Though there is no IP address for each unnumbered interface, the system containing the unnumbered interface(s) must have a router ID (SCN IP Address) provisioned for signaling communications network. The router ID is used as if it is the IP address of all unnumbered interfaces in the system.

Steps

Complete the following steps to configure SCN parameters.

1 Select **Administration** → **Data Communications** from the System View menu. Click on the **SCN** tab.

Alternatively, use the **`ent-fecom-scn`** TL1 command to provision the Line DCC and LAN-3 parameters and the **`ent-route-scn`** TL1 command to provision the manual IP route for the Signaling Communications Network (SCN).

2 For the Line DCC, select the **Port AID** for the port being provisioned. Select **`Enabled`** or **`Disabled`** for the **IP Over Line DCC**.

Reference: Table 9-3, "ENT-FECOM-SCN Line DCC and LAN-3 parameters" (p. 9-167)

3 For LAN, select **`Enabled`** or **`Disabled`** for the **IP Over LAN**. Provision the remaining parameters from your work instructions.

Reference: Table 9-3, "ENT-FECOM-SCN Line DCC and LAN-3 parameters" (p. 9-167)

4 For the SCN IP Manual IP Route, click on the glasses icon to add/modify/delete an entry. Provision the parameters from your work instructions.

Reference: Table 9-4, "ENT-ROUTE-SCN parameters" (p. 9-168)

END OF STEPS

SCN Line DCC and LAN-3 parameters

Table 9-3, "ENT-FECOM-SCN Line DCC and LAN-3 parameters" (p. 9-167) lists the provisionable parameters for SCN line DCC and LAN-3:

Table 9-3 ENT-FECOM-SCN Line DCC and LAN-3 parameters

Parameter	Description
Line DCC	
ip_linedcc	**IP Over Line DCC**. This parameter enables or disables the IP communications over the specified DCC (Line) interface. Valid values are Enabled or Disabled. The initial value is Disabled. The **IP Over Line DCC** only applies to the following circuit packs, LNW55, LNW59, LNW62, LNW82, LNW504, and LNW603.
LAN Parameters	
ip_lan	**IP Over LAN**. This parameter enables or disables the IP communications over the specified LAN interface. Valid values are Enabled or Disabled. The initial value is Disabled.
ipaddr_lan	**LAN IP Address**. This is the 32-bit IP address for the specified LAN port. It consists of four dot-separated decimal numbers ranging from 0 to 255. The initial value is a null. If IP is disabled on a LAN port, IP address 0.0.0.0 can be used to delete a previously provisioned IP address.

Table 9-3 ENT-FECOM-SCN Line DCC and LAN-3 parameters (continued)

Parameter	Description
ipsnmk_lan	**LAN IP Subnet Mask**. This is the 32-bit IP subnet mask for the specified LAN port. It consists of four dot-separated decimal numbers ranging from 0 to 255, with the restriction that all four integers represent (in binary) one or more '1' bits, followed by zero or more '0' bits (that is, all '1' are near the most significant bit, all '0' are near the least significant bit). The initial value is a null. If IP is disabled on a LAN port, IP subnet mask 0.0.0.0 can be used to delete a previously provisioned subnet mask.

SCN IP Manual IP Route parameters

Table 9-4, "ENT-ROUTE-SCN parameters" (p. 9-168) lists the provisionable parameters for a Manual IP Route:

Table 9-4 ENT-ROUTE-SCN parameters

Parameter	Description
SCN IP Manual IP Route	
dest_ip	**Dest IP Address**. This is a destination IP address. It consists of four dot-separated decimal numbers ranging from 0 to 255. The combination of this parameter, dest_mask and outgoing_intf identifies an unique manual route entry. It is a required parameter, and there is no default value. More than one manual route entry can be provisioned by executing the command multiple times. A maximum of 20 different manual route entries can be provisioned.
dest_mask	**Dest IP Subnet Mask**. Destination IP Subnet Mask. This is the 32-bit IP subnet mask, consisting of four dot-separated decimal numbers ranging from 0 to 255. It is a required parameter, and there is no default value.
outgoing_intf	**Outgoing Interface**. This is the outgoing interface used to send the IP packets to the destination IP address. It specifies a LAN or DCC AID address, excluding AIDs ending with "-all". It is a required parameter, and there is no default value. For LAN, only LAN-3 is allowed.
nexthop_ip	**Next Hop IP Address**. This is the IP address of the next hop (router) to reach the destination IP address. It consists of four dot-separated decimal numbers ranging from 0 to 255. It is a required parameter if the outgoing interface is a LAN. It must not be specified if the outgoing interface is a DCC.

Procedure 9-13.5: Create control plane network connections

Overview

Use this procedure to create an end-to-end soft permanent connection (SPC) between the specified TNA end points.

A soft permanent connection is a user-to-user connection in which the user-to-network portion of the end-to-end connection is established by the network management system as a permanent connection, and the network portion of the end-to-end connection is established as a switched connection using the control plane. See Figure 9-21, “Soft permanent connection (SPC) in a control plane network” (p. 9-173).

An end-to-end connection connecting edge ports consists of E-NNI connection segment(s) and I-NNI connection segment(s). E-NNI signaling is responsible for establishing the E-NNI portion of the end-to-end connection, as well as providing additional information that conveys the end-to-end request to the border nodes in the core for establishing the I-NNI portion of the end-to-end connection. In the control plane, the end-to-end points of an SPC are identified by Source and Destination TNAs, Source and Destination Logical Port IDs, and Source and Destination Subnetwork Point (SNP) IDs (called Source Labels [timeslot tributaries]). See Table 9-5, “ENT-CONN parameters” (p. 9-170).

Steps

Complete the following steps to create a control plane network connection. Refer to Table 1.

1 From the System View menu, select **Configuration** → **Create Control Plane Network Connections**.

2 Enter the Service Attributes for the control plane connection.

Reference: Table 9-5, “ENT-CONN parameters” (p. 9-170)

3 Select the **Source TNA Address Type** from the Source End Point attributes, then click **Select**.

Result: The Tributary selection screen displays.

4 Expand the TNA address being used for the connection, select (highlight) the logical port. Click on the tributary, then click **Select** at the bottom of the screen.

Result: The Source End Point attributes (Source TNA Address, Source Logical Port, and Source Label) are filled in.

5 Enter the parameters for the Destination End Point attributes, then click **Apply**. Read the warning message, then click **Yes** to execute the command.

Result: Within a few seconds, a completion message is received.

6 Read the completion message, click **OK**, then click **Cancel** to exit.

7 From the System View menu, select **View** → **Control Plane Network Connections** to verify the connection.

END OF STEPS

Control plane network connection parameters

Table 9-5, "ENT-CONN parameters" (p. 9-170) lists the provisionable parameters for a control plane network connection:

Table 9-5 ENT-CONN parameters

Parameter	Description
	Service Parameters
callid	**Call ID**. Call Identifier is an operator-specific fixed-length 12-byte (24-character) hexadecimal string. One suggested format is where the first 4 bytes (8 characters) represent the source network element address (the hexadecimal encoding of the nodeid [ent-node]) and the remaining 8 bytes (16 characters) represent the local identifier.
protype	**Protection Type**. Protection type specifies the protection type for the E-NNI segments of the SPC. Value: • 0x1 — unprotected • 1+1 — protected
servlevel	**Service Level** is an integer in the range 0–255 that specifies the service level for the I-NNI segments of the SPC.

Table 9-5 ENT-CONN parameters (continued)

Parameter	Description
dir	**Direction**. Direction specifies whether the connection is unidirectional or bidirectional. Value: • 1WAY — unidirectional • 2WAY — bidirectional
bandwidth	**Signal Rate** specifies the signal rate of the connection. Values: • STS1 • STS3c • STS12c • STS48c • STS192c
Source End Point Parameters	
srctnatype	**Source TNA Address Type**. Source Transport Network Assigned Address (TNA) Type. Values: • IPv4 — An IPv4 formatted Source TNA address consisting of four dot-separated integers ranging from 0 to 255, for example, 220.10.10.10. • IPv6 — An IPv6 formatted Source TNA address consisting of 8 dash-separated 4-digit hexadecimal numbers. For example, fedc-0000-0000-76b4-417a-1080-3210-1111. • NSAP — An NSAP formatted Source TNA address consisting of a 40-digit hexadecimal string. For example, 39840f80000000000000000000008006a067197aa.
srctnaaddress	**Source TNA Address**. Identifies an address assigned to one endpoint of the connection by the transport service provider. Srctnaaddress, in conjunction with srclogportid and srclabel, identifies the source of the connection. See srctnatype for the allowable srctnaaddress values as a function of the srctnatype value.
srclogportid	**Source Logical Port ID**. An integer that identifies the source EDGE port (within the TNA). In conjunction with srctnaaddress and srclabel, it identifies the source of the connection. Value is an integer in the range from 1 to 4294967295.

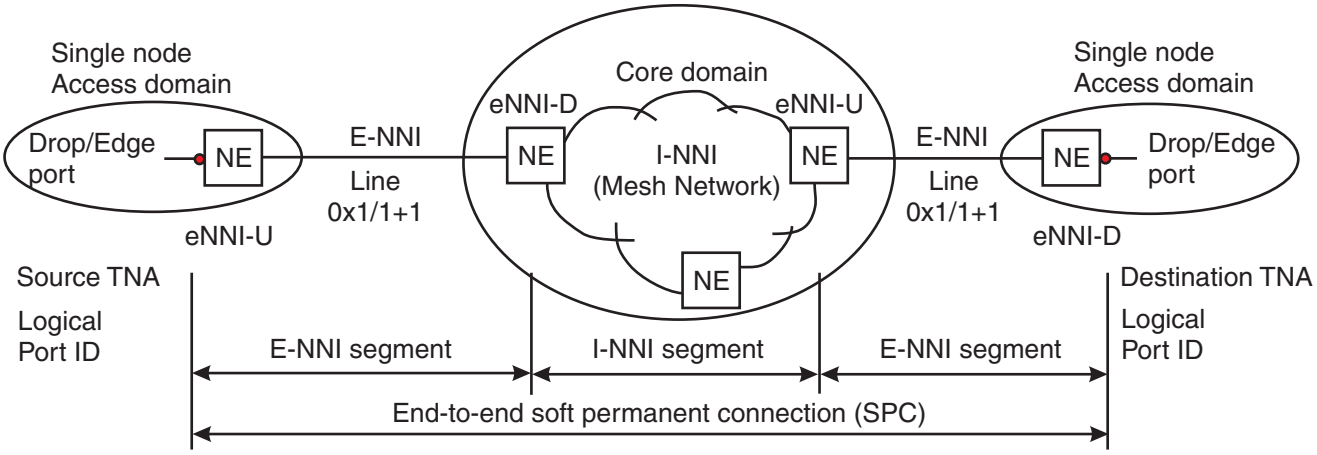
Table 9-5 ENT-CONN parameters (continued)

Parameter	Description
srclabel	**Source Label**. Source Label specifies a timeslot (tributary) on the source EDGE port identified by srclogportid. In conjunction with srctnaaddress and srclogportid, it identifies the source of the connection. Source Label has a format of S-U-K-L-M, where: S specifies a particular STS-3 group within an STS-N, U specifies a particular STS-1 within an STS-3 group. K, L, and M are each 0. Values: • S – 0 (port/line with a rate of STS1 or less) – 1 (1st STS-3c within an STS-N) – 2 (2st STS-3c within an STS-N) ... – N/3 (N/3th STS-3c within an OC-N port) • U – 0 (on port/line with a rate of STS1 or less, and when Signal Rate (bandwidth)=STS3c or greater) – 1 (1st STS-1 within an STS-3) – 2 (2nd STS-1 within an STS-3) – 3 (3rd STS-1 within an STS-3) • K=0 • L=0 • M=0 For example, for connecting the fourth STS-1 in an OC-48 EDGE port, srclabel=2-1-0-0-0. For a connection to a VCG EDGE port, divide the VCG tributaries into groups of 3 (1–3, 4–6, 7–9,...) and apply the rules for OC-n ports.
Destination End Point Parameters	
desttnatype	**Destination TNA Address Type.**. Destination Transport Network Assigned Address (TNA) Type. See srctnatype for the format description.
desttnaaddress	**Destination TNA Address**. Destination Transport Network Assigned Address (TNA) identifies an address assigned to one endpoint of the connection by the transport service provider. desttnaaddress, in conjunction with destlogportid and destlabel, identifies the destination of the connection. See desttnatype for the allowable values as a function of the desttnatype value.

Table 9-5 ENT-CONN parameters (continued)

Parameter	Description
destlogportid	**Destination Logical Port ID**. Destination Logical Port ID is an integer that identifies the destination EDGE port (within the TNA). In conjunction with desttnaaddress and destlabel, it identifies the source of the connection. Value is an integer in the range from 1 to 4294967295.
destlabel	**Destination Label**. Destination Label specifies a timeslot (tributary) on the destination EDGE port identified by destlogportid. In conjunction with desttnaaddress and destlogportid, it identifies the destination of the connection. See srclabel for the format description.

Figure 9-21 Soft permanent connection (SPC) in a control plane network



eNNI-U - Upstream signalling protocol identifier (SPC)
eNNI-D - Downstream signalling protocol identifier

Procedure 9-13.6: Delete control plane network connections

Overview

This procedure allows you to delete all control plane connections associated with a specific Call ID (callid), or a single control plane connection identified by the Call ID and Connection ID (connid) parameters.

End-to-end connections are deleted using the *WaveStar*® CIT or the TL1 **`dlt-conn`** command. End-to-end connections originating at the addressed source node may be deleted using the **Configuration** → **Delete Control Plane Network Connections** → **Graceful** command (TL1 **`dlt-conn`** command using cmdmde = NORM). End-to-end connections originating at a remote ingress node of any domain may be deleted using the **Configuration** → **Delete Control Plane Network Connections** → **Force** command (TL1 **`dlt-conn`** command using cmdmde = FRCD).

Steps

Use this procedure to delete an end-to-end soft permanent connection (SPC).

1 If required, use the **View** → **Control Plane Network Connections** from the System View menu to view existing control plane connections.

2 From the System View menu, select **Configuration** → **Delete Control Plane Network Connections** → **Graceful** to delete connections originating at this source node (Connection Source = Local) or select **Configuration** → **Delete Control Plane Network Connections** → **Force** to delete connections originating at a remote node (Connection Source = Remote).

Result: The Delete Control Plane Network Connection screen appears listing all existing connections.

Reference: “Connection List” (p. 9-175)

3 If required, select **Call ID**, then choose a desired **Call ID** in the drop-down box to display only those connections associated with the selected Call ID.

Result: If Call ID is selected, an option to **Delete All** is displayed.

4 Select the connection being deleted in the display box. Or, if you want to delete all connections associated with a Call ID, then select **Delete All**.

5 Click **OK** to delete the connection(s). Read the warning message, then click **Yes** to execute the command.

Result: Within a few seconds, a completion message is received.

6 Read the completion message, then click **OK**.

Repeat from Step 3 to delete other connections as required or click **Cancel** to exit.

7 If required, from the System View menu, select **View** → **Control Plane Network Connections** to verify the connection deletion.

END OF STEPS

Connection List

The control plane network connection lists the following:

- Connection Source — Local or Remote.
- Call ID — Operator-specific call identifier. A Call ID is a fixed-length 12-byte (24 characters) hexadecimal string specified during the original connection.
- Connection ID — An unique identifier for a connection segment within the local domain. A character string containing up to 41 characters that is composed of the source node ID, a tributary aid and an index number. For example: 200.10.10.10&1-1-2-1-1&100.

  Format:

  – nodeid: The node ID of the ingress node within the local domain for this connection. It is an IPv4 formatted identifier consisting of four dot-separated integers ranging from 0 to 255. See Procedure 9-13.1: “Provision system level node parameters” (p. 9-157).

  – tributary_aid: A dash-separated string of 5 integers, representing Bay/Frame, Shelf, Slot, Port, and Tributary, that identifies the ingress port’s tributary within the local domain for this connection. Values: Bay/Frame = 1, Shelf =1, Slot = , refer to Table 9-6, “Slot AID mapping” (p. 9-175), Port = 1–48, Tributary = 1–192.

  – index: An integer in the range 0 to 4294967295.

Table 9-6 Slot AID mapping

main-1	1
main-2	2

Table 9-6 Slot AID mapping (continued)

fn-a-1	3
fn-a-2	4
fn-b-1	5
fn-b-2	6
fn-c-1	7
fn-c-2	8
fn-d-1	9
fn-d-2	10
growth-1	11
growth-2	12

Procedure 9-14: Establish DWDM OTU2 line

Overview

Use this procedure to establish a DWDM OTU2 line.

Important! This procedure assumes that the DWDM OTU2 line is established by interconnecting two Alcatel-Lucent 1665 DMX nodes using LNW705 XM10G/8 10G Muxponder circuit packs.

This procedure assumes that all Alcatel-Lucent 1665 DMX shelves have been equipped with the required XM10G/8 circuit packs/pluggable transmission modules and software has been installed. If not, refer to Chapter 5, "Node turnup procedures".

Ignore all alarms until the procedure is complete.

Privilege level

You must log in as a Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 9-2) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the slots, circuit packs, pluggable transmission modules, ports, and network element parameters to be used for this procedure.

Steps

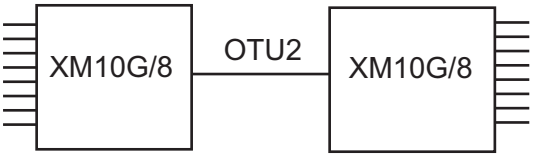
Complete the following steps to a DWDM OTU2 line.

1 **Important!** The XM10G/8 circuit pack at the near-end node may be connected to an XM10G/8 circuit pack at the far-end node, or the XM10G/8 circuit packs may be connected using OMD circuit packs at the near-end and far-end nodes.

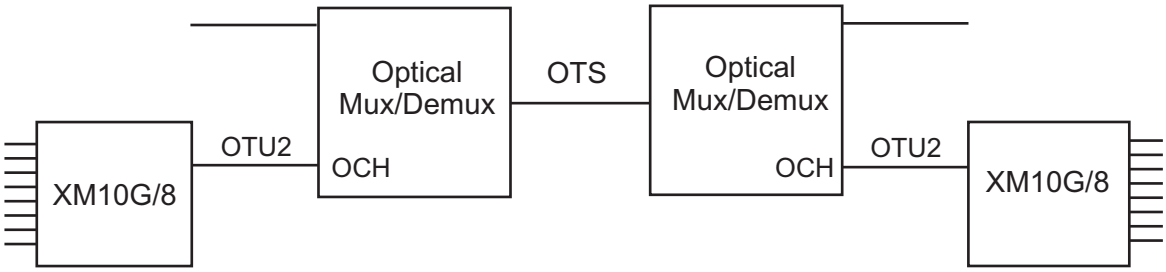
Determine the network configuration to be established using the work instructions and office records.

Examples:

Example A: Two XM10G/8 circuit packs



Example B: Two XM10G/8 and Two OMD circuit packs



OTU2 line

2 **Important!** The network element TID (target identifier) must be unique in the network.

At the near-end node, select **Administration** → **View NE Administration** to access the NE administrative parameters. Verify that the *NE Parameters* and *NSAP* are provisioned correctly using the work instruction and/or office records and click **Close**.

If provisioning changes are required, refer to the appropriate procedure(s) in Chapter 7, "System administration procedures".

3 At the near-end node, verify/install the required XM10G/8 circuit pack and pluggable transmission module in the required Function/Growth slots.

Reference:

- Procedure 4-28: "Install 10G Muxponder circuit packs" (p. 4-137)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

4 At the near-end node, select **Configuration** → **Equipment** to access the required XM10G/8 circuit pack and provision the circuit pack/pluggable transmission module/OTU2 port parameters according to the work instructions.

Reference: Procedure 4-29: "Provision 10G Muxponder circuit pack/optical channel transport unit (OTU2) port" (p. 4-141)

5 At the far-end node, repeat Step 2 through Step 4 to provision the required node, circuit pack, pluggable transmission module, and OTU2 port functions according to the work instructions.

6

If interconnecting the XM10G/8 circuit packs...	Then...
using OMD circuit packs at the near-end and far-end nodes,	Perform Procedure 10-15: "Add optical channel (OCH) to DWDM network" (p. 10-92) and then proceed to Step 9.
without using OMD circuit packs at the near-end and far-end nodes,	Continue with the next step.

7 **Important!** OCH cross-connections to/from an OTU2 port are used to inform the network element about manual fiber connections. This allows the network element to enable alarm reporting and assign the 10G Muxponder internal STS cross-connection fabric to the provisioned client ports.

At the near-end and far-end nodes, select **Configuration** → **OCH Cross-Connections** to access the *OCH Cross-Connection Wizard* and provision the required OCH cross-connections between the OTU2 port and remote AID (REMAID).

8 Connect the optical fibers and verify the integrity of the OTU2 line being established.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

9 Perform end-to-end OTU2 line test.

Reference: Procedure 14-37: “Perform end-to-end optical line test on DWDM line” (p. 14-169)

10 At the near-end and far-end nodes, click the **Alarm List** button and verify that no alarms are present. If required, clear any alarms that are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

11 The OTU2 line is now ready for SONET/GbE/Data client signals to be added.

Reference: Procedure 10-17: “Add SONET/GbE/Data client signal” (p. 10-101)

END OF STEPS

10 TDM service provisioning procedures

Overview

Purpose

This chapter includes procedures to provision non-control plane traditional TDM services. For information about provisioning control plane ENNI and edge traffic, refer to Procedure 9-13: “Establish external network-to-network interface (E-NNI)” (p. 9-154).

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedures, that additional equipment is listed in that procedure.

Procedure 10-1: Establish DS1 or E1 service

Overview

Use this procedure to establish end-to-end DS1 or E1 service.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelf and network have been properly equipped and tested. If the Alcatel-Lucent 1665 DMX shelf has not been properly equipped, refer to Chapter 5, "Node turnup procedures". If the network has not been properly configured, refer to Chapter 9, "Network configuration procedures".

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, pass-through nodes (UPSRs/BLSRs only), DS1/E1 port addresses, the DS1/E1 port parameters to provision, and the cross-connections to be established.

Steps

Complete the following steps to establish end-to-end DS1 or E1 service.

1 Click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 From the System View menu at each terminating node, select **View** → **Equipment** to verify that the proper service and protection circuit packs have been installed in the Function Unit groups (A, B, C, or D) used for this service.

3 If circuit packs have not been installed, install circuit packs as required.

Reference: Procedure 4-8: “Install DS1/E1 circuit packs” (p. 4-47)

4 At the terminating nodes of the circuit being established, determine which DS1/E1 ports are to be put into service, and what port parameters to provision using the work instruction.

Important! All the ports on a DS1/E1 circuit pack are provisioned for either DS1 or E1; DS1 and E1 ports cannot be mixed on a single pack.

5 At the terminating nodes, select **Configuration** → **Equipment**. Expand the circuit pack details, then select the DS1/E1 port to provision for the circuit being established. Provision parameters as required.

The **Bi-Polar Violations** parameter does not apply to the LNW18/LNW20 TMUX circuit packs.

Bi-Polar Violations parameter value settings:

- *No* - When Bi-Polar Violations is set to **No** (default), incoming BPVs at the DS1 port are corrected by the port unit circuitry before the DS1 is mapped into the VT1.5 payload and are not translated in the outgoing direction. This value should be used if *not* connected to a GR-8 compliant DLC.
- *Yes* - Bi-Polar Violations should be set to **Yes** for a DS1 port connected to a GR-8 compliant DLC terminal. This permits the DLC system to detect LOS or LOF and switch to protection. If linecde=B8ZS, incoming bpv threshold crossings detected on the provisioned port will be translated to LOF before the DS1 is mapped into the VT1.5 payload. If linecde=AMI, incoming bpv threshold crossings detected on the provisioned port will be translated to LOS before the DS1 is mapped into the VT1.5 payload.

If the **Port Monitoring Mode** is provisioned to *NMON*, the port is not monitored/alarmed and the port will not automatically transition to the *IS* (in-service) state when a good signal (not LOS) is detected. If the **Port Monitoring Mode** is provisioned to *AUTO*, the port automatically transitions to the *IS* (in-service) state when a good signal (not LOS) is detected, and the port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

Reference: Procedure 4-9: “Provision DS1/E1 circuit packs/ports for service” (p. 4-50)

6 Verify that the DS1/E1 cable connections have been made from the terminating nodes to the cross-connect panel or equivalent connection points.

7 Determine the necessary add/drop and pass-through (UPSRs/BLSRs only) cross-connections for each node from the work instructions.

8 At the terminating nodes and pass-through nodes (UPSR/BLSRs only), select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and establish the necessary cross-connections. Use the following references as examples.

Reference:

- Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)
- Procedure 10-6: "Make Function unit UPSR, hairpin, and Main to Function unit UPSR cross-connections" (p. 10-23)
- Procedure 10-7: "Make 1+1 (linear extension) cross-connections" (p. 10-27)
- Procedure 10-8: "Make single-homed cross-connections" (p. 10-34)
- Procedure 10-9: "Make dual-homed cross-connections" (p. 10-41)
- Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58)
- Procedure 10-12: "Provision DS1/DS3 locked cross-connections on a UPSR" (p. 10-66)
- Procedure 10-13: "Provision VT1.5 cross-connections on a BLSR" (p. 10-73)
- Procedure 10-14: "Configure LNW20 TMUX/DS3/EC1 applications" (p. 10-80)

9 Perform the DS1/E1 end-to-end transmission test for each circuit being put into service, as required.

Reference: Procedure 14-9: "Perform DS1/E1 transmission test" (p. 14-69)

10 **Important!** If the **Port Monitoring Mode** is provisioned to *NMON*, the port is not monitored/alarmed and the port will not automatically transition to the *IS* (in-service) state when a good signal (not LOS) is detected. If the **Port Monitoring Mode** is provisioned to *AUTO*, the port automatically transitions to the *IS* (in-service) state when a good signal (not LOS) is detected, and the port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

At the terminating nodes, select **View** → **Equipment** to access the required DS/E1 ports and verify the value of the **Port Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access DS1/E1 ports and change the value of the **Port Monitoring Mode** parameter.

11 **Important!** If the **Tributary Monitoring Mode** is provisioned to *NMON*, the tributary is not monitored/alarmed and the tributary will not automatically transition to the *IS* (in-service) state when a good signal (not UNEQ, AIS, LOP, SF) is detected. If the **Tributary Monitoring Mode** is provisioned to *AUTO*, the tributary automatically transitions to the *IS* (in-service) state when a good signal (not UNEQ, AIS, LOP, SF) is detected, and the tributary is monitored/alarmed.

At the terminating nodes and pass-through nodes (UPSRs/BLSRs only), select **View** → **Equipment** to access the required tributaries and verify the value of the **Tributary Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access tributaries and change the value of the **Tributary Monitoring Mode** parameter.

END OF STEPS

Procedure 10-2: Discontinue DS1 or E1 service

Overview

Use this procedure to discontinue end-to-end DS1 or E1 service.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX is in service and that a DS1/E1 port is being discontinued.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, pass-through nodes (UPSRs/BLSRs only), DS/E1 port addresses, and cross-connections to be deleted.

Steps

Complete the following steps to discontinue end-to-end DS1 or E1 service.

1 Using the work instructions, determine the DS1/E1 port to be discontinued.

2 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 **Important!** This step may activate the office alarms. The audible alarm may be suppressed by pressing the **ACO** push-button.

At the cross-connect panel or equivalent connection point at the terminating nodes, remove the DS1/E1 signal associated with the port being discontinued.

Result: The **FAULT** LED flashes on the circuit pack with signals removed.

4 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the correct DS1/E1 signal was removed.

5 At the terminating nodes, select **Configuration** →**Update System** → **Update States** to clear the DS1/E1 LOS alarms.

Result: The flashing **FAULT** LEDs go off.

6 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the DS1/E1 LOS alarm is cleared.

7 At the terminating nodes, select **View** → **Equipment** to access the required DS1/E1 ports and verify that the **Port Monitoring Mode** changed to *AUTO*.

8 Determine the cross-connections for the circuit being discontinued using the work instructions, *or* at the terminating nodes and non-terminating nodes (UPSRs/BLSRs only), select **View** → **Cross-Connections** to obtain a current list of cross-connections.

Record the source addresses (**SRC**) of the cross-connections to be deleted.

9 At the terminating nodes, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete the add/drop cross-connections for all DS1/E1 service being removed.

(Refer to the cross-connection source addresses recorded in Step 8.)

Important! DS1/E1 slots cannot be unequipped without an alarm until all port cross-connections are removed.

10 If required, at each pass-through node (UPSRs/BLSRs only) select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete the pass-through cross-connections for all DS1/E1 service being removed.

(Refer to the cross-connection source addresses recorded in Step 8.)

11 **Important!** The LNW6/7 28DS1/DS1PM circuit packs have 28 DS1 ports. The LNW8/LNW801 56DS1/E1 circuit pack has 56 DS1/E1 ports.

If *all* ports on the circuit pack are being discontinued, you may remove the circuit pack, if required.

12 Have circuit packs been removed?

If...	Then...
Yes,	Continue with Step 13.
No,	Proceed to Step 15.

13 If circuit packs have been removed, update the internal equipment list. From the System View menu select **Configuration** → **Update System** → **Update Inventory**.

Click **OK**.

14 Insert 177D application blanks or LNW98 Detectable Blank circuit packs into the empty slots, then go to Step 16.

15 If circuit packs have not been removed, provision the **Port Monitoring Mode** of the DS1/E1 ports to *AUTO*, *NMON*, or *IS*, as required.

From the System View menu select **Configuration** → **Equipment**, expand the required circuit pack details, then select the DS1/E1 port.

Under the **Fault Management** section, select *NMON* (Not Monitored) or *AUTO* (Automatic) for the **Port Monitoring Mode** .

> **Important!** If the Port Monitoring Mode is *NMON*, the port is not monitored/alarmed, and the port will not automatically transition to the *in service* state if a valid signal is detected. If the Port Monitoring Mode is *AUTO*, the port automatically transitions to the *in service* state if a valid signal is detected and the port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

16 At the terminating nodes and non-terminating nodes (UPSRs/BLSRs only), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present.

END OF STEPS

Procedure 10-3: Establish DS3 or EC-1 service

Overview

Use this procedure to establish end-to-end DS3 or EC-1 service.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelf and network have been properly equipped and tested. If the Alcatel-Lucent 1665 DMX shelf has not been properly equipped, refer to Chapter 5, "Node turnup procedures". If the network has not been properly configured, refer to Chapter 9, "Network configuration procedures".

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, pass-through nodes (UPSRs/BLSRs only), DS3/EC-1 port addresses, the DS3/EC-1 port parameters to provision, and the cross-connections to be established.

Steps

Complete the following steps to establish end-to-end DS3 or EC-1 service.

1 Click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 At the terminating nodes, select **View** → **Equipment** to verify that the proper service and protection DS3/EC-1 circuit packs have been installed in the Function Unit group (A, B, C, or D) used for this service.

3 If circuit packs have not been installed, install circuit packs as required.

Reference: Procedure 4-6: "Install DS3/EC1 circuit packs" (p. 4-40)

4 At the terminating nodes of the circuit being established, determine which DS3/EC-1 ports are to be put into service and what port parameters to provision using the work instructions.

5 At the terminating nodes, select **Configuration** → **Equipment**. Expand the required circuit pack details, then select the DS3/EC-1 port to provision for the circuit being established. Provision parameters as required.

If the **Port Monitoring Mode** is provisioned to *NMON*, the port is not monitored/alarmed and the port will not automatically transition to the *IS* (in-service) state when a good signal (not LOS) is detected. If the **Port Monitoring Mode** is provisioned to *AUTO*, the port automatically transitions to the *IS* (in-service) state when a good signal (not LOS) is detected, and the port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

Reference: Procedure 4-7: "Provision DS3/EC1 circuit packs/ports for service" (p. 4-44)

6 Verify that the DS3/EC-1 cable connections have been made from the terminating nodes to the cross-connect panel or equivalent connection points.

7 Determine the necessary add/drop and pass-through (UPSRs/BLSRs only) cross-connections for each node from the work instructions.

8 At the terminating nodes and pass-through nodes (UPSRs/BLSRs only), select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and establish the necessary cross-connections. Use the following references as examples.

Reference:

- Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)
- Procedure 10-6: "Make Function unit UPSR, hairpin, and Main to Function unit UPSR cross-connections" (p. 10-23)
- Procedure 10-7: "Make 1+1 (linear extension) cross-connections" (p. 10-27)
- Procedure 10-8: "Make single-homed cross-connections" (p. 10-34)
- Procedure 10-9: "Make dual-homed cross-connections" (p. 10-41)

- Procedure 10-11: “Establish dual ring interworking (DRI) connections” (p. 10-58)
- Procedure 10-12: “Provision DS1/DS3 locked cross-connections on a UPSR” (p. 10-66)
- Procedure 10-13: “Provision VT1.5 cross-connections on a BLSR” (p. 10-73)
- Procedure 10-14: “Configure LNW20 TMUX/DS3/EC1 applications” (p. 10-80)

9 Perform the DS3/EC-1 end-to-end transmission test for each circuit being put into service, as required.

Reference:

- Procedure 14-10: “Perform DS3 transmission test” (p. 14-76)
- Procedure 14-11: “Perform EC-1 transmission test” (p. 14-82)

10 **Important!** If the **Port Monitoring Mode** is provisioned to *NMON*, the port is not monitored/alarmed and the port will not automatically transition to the *IS* (in-service) state when a good signal (not LOS) is detected. If the **Port Monitoring Mode** is provisioned to *AUTO*, the port automatically transitions to the *IS* (in-service) state when a good signal (not LOS) is detected, and the port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

At the terminating nodes, select **View** → **Equipment** to access the required DS3/EC-1 ports and verify the value of the **Port Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access DS3/EC-1 ports and change the value of the **Port Monitoring Mode** parameter.

11 **Important!** If the **Tributary Monitoring Mode** is provisioned to *NMON*, the tributary is not monitored/alarmed and the tributary will not automatically transition to the *IS* (in-service) state when a good signal (not UNEQ, AIS, LOP, SF) is detected. If the **Tributary Monitoring Mode** is provisioned to *AUTO*, the tributary automatically transitions to the *IS* (in-service) state when a good signal (not UNEQ, AIS, LOP, SF) is detected, and the tributary is monitored/alarmed.

At the terminating nodes and pass-through nodes (UPSRs/BLSRs only), select **View** → **Equipment** to access the required tributaries and verify the value of the **Tributary Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access tributaries and change the value of the **Tributary Monitoring Mode** parameter.

END OF STEPS

Procedure 10-4: Discontinue DS3 or EC-1 service

Overview

Use this procedure to discontinue end-to-end DS3 or EC-1 service.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX is in service and that a DS3/EC-1 port is being discontinued.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, pass-through nodes (UPSR/BLSRs only), DS3/EC-1 port addresses, and cross-connections to be deleted.

Steps

Complete the following steps to discontinue end-to-end DS3 or EC-1 service.

1 Using the work instructions, determine the DS3/EC-1 port to be discontinued.

2 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 **Important!** This step may activate the office alarms. The audible alarm may be suppressed by pressing the **ACO** push-button.

At the cross-connect panel or equivalent connection point at the terminating nodes, remove the DS3/EC-1 signal associated with the port being discontinued.

Result: The **FAULT** LED flashes on the circuit pack with signals removed.

4 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the correct DS3/EC-1 signal was removed.

5 At the terminating nodes, select **Configuration** →**Update System** → **Update States** to clear the DS3/EC-1 LOS alarms.

Result: The flashing **FAULT** LEDs go off.

6 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the DS3/EC-1 LOS alarm is cleared.

7 At the terminating nodes, select **View** → **Equipment** to access the required DS3/EC-1 ports and verify that the **Port Monitoring Mode** changed to *AUTO*.

8 Determine the cross-connections for the circuit being discontinued using the work instructions, *or* at the terminating nodes and non-terminating nodes (UPSRs/BLSRs only), select **View** → **Cross-Connections** to obtain a current list of cross-connections.

Record the source addresses (**SRC**) of the cross-connections to be deleted.

9 At the terminating nodes, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete the add/drop cross-connections for all DS3/EC-1 service being removed.

(Refer to the cross-connection source addresses recorded in Step 8.)

Important! DS3/EC-1 slots cannot be unequipped without an alarm until all port cross-connections are removed.

10 If required, at each pass-through node (UPSRs/BLSRs only) select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete the pass-through cross-connections for all DS3/EC-1 service being removed.

(Refer to the cross-connection source addresses recorded in Step 8.)

11 **Important!** The LNW16 circuit packs have 12 DS3/EC-1 ports. The LNW19/19B circuit packs have 48 DS3/EC-1 ports.

If *all* the DS3/EC-1 ports on the circuit pack are being discontinued, you may remove the circuit pack, if required.

12 If circuit packs have been removed continue with Step 13, otherwise proceed to Step 14.

13 If circuit packs have been removed, update the Alcatel-Lucent 1665 DMX internal equipment list.

From the System View menu select **Configuration** → **Update System** → **Update Inventory**.

Click **OK**.

Insert 177D application blanks or LNW98 Detectable Blank circuit packs into empty slots, then proceed to Step 15.

14 If circuit packs have not been removed, provision the **Port Monitoring Mode** of the DS3/EC-1 ports to *AUTO*, *NMON*, or *IS* as required.

From the System View menu select **Configuration** → **Equipment**, expand the required circuit pack details, then select the DS3/EC-1 port.

Under the **Fault Management** section, select *NMON* (Not Monitored), *AUTO* (Automatic), or *IS* (In Service) for the **Port Monitoring Mode** .

> **Important!** If the Port Monitoring Mode is *NMON*, the port is not monitored/alarmed, and the port will not automatically transition to the *in service* state if a valid signal is detected. If the Port Monitoring Mode is *AUTO*, the port automatically transitions to the *in service* state if a valid signal is detected and the port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

15 At the terminating nodes and non-terminating nodes (UPSRs/BLSRs only), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present.

END OF STEPS

Procedure 10-5: Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration

Overview

Use this procedure as an example for VT1.5 or STS-n cross-connections.

This procedure uses examples of cross-connections to DS1 and DS3 interfaces to illustrate the steps involved in cross-connections in a single UPSR ring configuration. This same procedure could also be used to make any allowable VT1.5, STS-1, STS-3c, STS-12c, STS-48c, or STS-192c cross-connection. This procedure uses the CIT *Cross-Connection Wizard* commands to illustrate the provisioning. The same provisioning may be made using the TL1 **`ent-crs-( )`** command. Note that E1 services require an STS-3c cross-connection.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that you have the work instructions for this procedure stating the circuit pack and port options to be set, the pass-through and terminating end nodes, and cross-connections being made.

Steps

Complete the following steps to make the necessary cross-connections.

1 Log in to any node in each ring in the network and retrieve a map of the network which lists all the systems and how they are connected to each other. From the System View menu select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map**.

2 Verify that the system configuration is the same as specified on the work order or circuit order.

3 From work order or circuit order, determine the terminating (drop) nodes and the pass-through nodes for the service being established.

Important! In ring configurations, use the following general rules for establishing cross-connections.

1. All cross-connections to/from the same STS-1 timeslot must be provisioned the same, either all VT1.5 or STS-1.
2. If all 28 VT1.5s (DS1s) in an STS-1 are being passed through at a node in a VT1.5 path-switched ring, then the cross-connection may be provisioned as either a pass-through STS-1 or VT1.5. However, if you are dropping VT1.5s from the pass through node in the future or monitoring VT path faults, you should provision the pass-throughs as VT1.5 cross-connections.

See *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306* for more detailed information on types of cross-connections, and restrictions regarding rates, circuit pack types, and VT granularity.

4 Log in to each node in the network and verify that each shelf is properly equipped for the service being established. From the System View menu select **View** → **Equipment**.

5 From work order or circuit order, determine the cross-connections to be made at each node associated with the service to be established. See Figure 10-1, “Path protected OC-48 ring network (DS1 to DS1) with VT1.5 cross-connections” (p. 10-21) and Figure 10-2, “Path protected OC-48 ring network (DS3 to DS3) with STS-1 cross-connections” (p. 10-22) for DS1/DS3 cross-connection examples.

Important! Cross-connections supporting DS3 services are STS-1 cross-connections. Cross-connections supporting DS1 services may be either STS-1 or VT1.5 cross-connections. Use VT1.5 cross-connections for DS1 services if you expect to cross connect only *some* of the VT1.5 signals in the STS-1 channel. If STS-1 cross-connections are made at a shelf, there is a fixed mapping of all 28 VT1.5 cross-connections to a specific shelf group.

6 Starting at one of the terminating nodes for the circuit being established, at each node in the ring select **View** → **Cross-Connections** from the System View menu to verify that the cross-connections specified on the work order or circuit order may be made. If the cross-connections are already assigned to another service or improperly assigned, refer trouble to the organization responsible for facility design. Improperly assigned cross-connections may have to be deleted.

7 At all non-terminating nodes in the network, provision pass-through cross-connections. From the System View menu select **Configuration** → **Cross-Connections**, then use the *Cross-Connection Wizard* to make the cross-connections. Select **2-Way Point-to-Point, Through** for pass through cross-connections.

8 At the terminating (add/drop) nodes of the circuit being established, establish the terminating cross-connections. From the System View menu select **Configuration** → **Cross-Connections**, then use the *Cross-Connection Wizard* to make the **UPSR Ring Add/Drop** cross-connections.

Important! The channel mode provisioning feature provides In-Service, Automatic, or Not Monitored states for VT and STS channels similar to the port modes for DS1 and DS3 ports. At installation, or when a cross connection is made to a point of termination, the channel is in the Automatic mode and alarming is suppressed until a valid signal is received. The channel must receive a good signal from either side of the ring to cause the channel to transition to in-service.

9 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

Alarms are not reported until the channel state transitions to in-service (IS) which happens only when a good signal is received. Cross-connections create connections to both sides of the ring. The channel state will transition once a good signal is received on either side of the ring.

10 Expand the details for the circuit pack being used. Select the required DS1/DS3 port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

11 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

- If the **Port Monitoring Mode** is *NMON* (Not Monitored),

Perform the following:

1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required DS1/DS3 port and then click **Select** at the bottom of the window.
2. Under the **Fault Management** section, select *AUTO* (Automatic) for the **Port Monitoring Mode**.
3. Click **Apply** at the bottom of the window.
4. Click **Close** to exit the window, then repeat this procedure from Step 9.

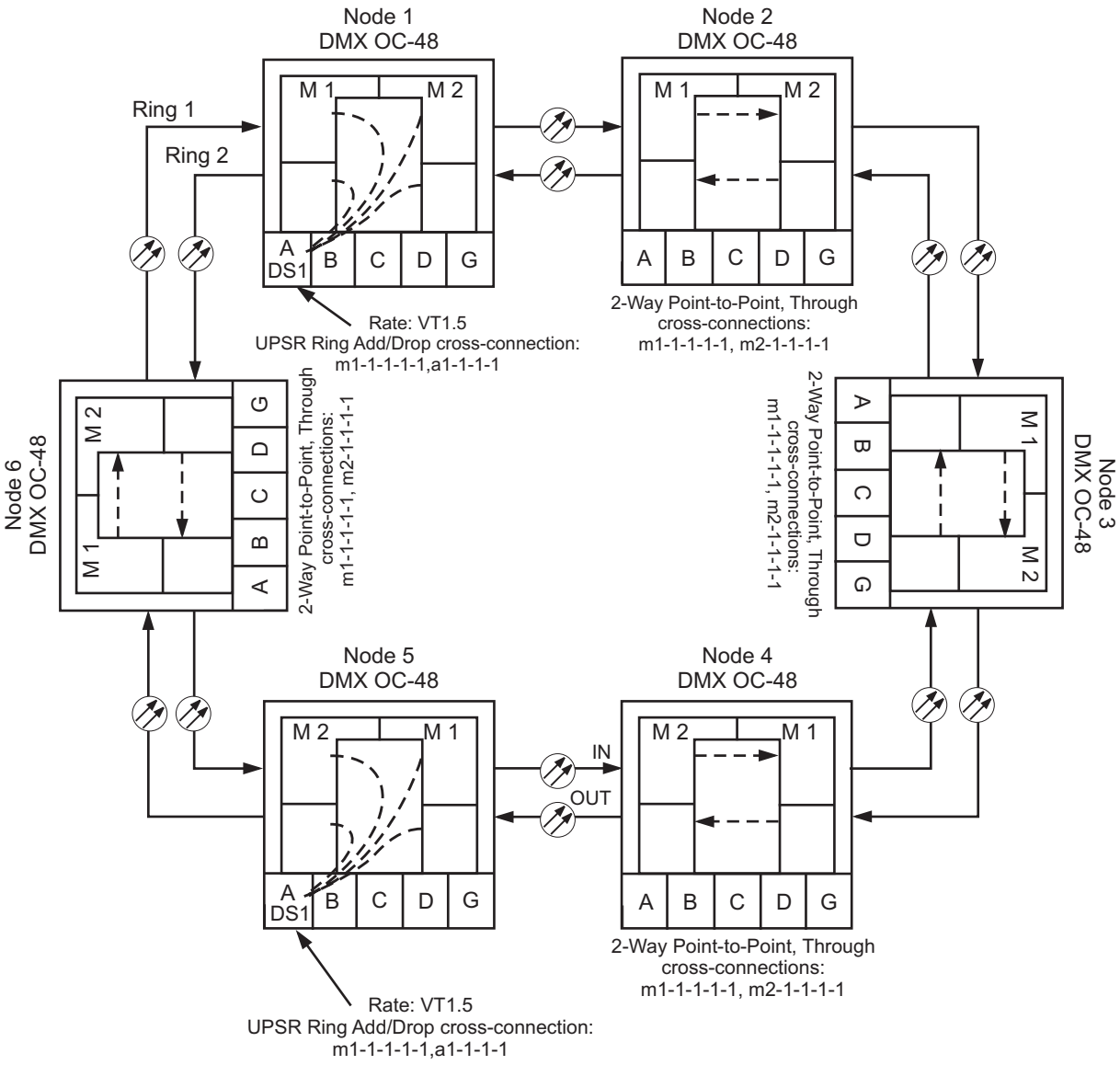
- If the **Port Monitoring Mode** is *AUTO*:

  Check the connections at the local cross-connect panel (or equivalent connection point).

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

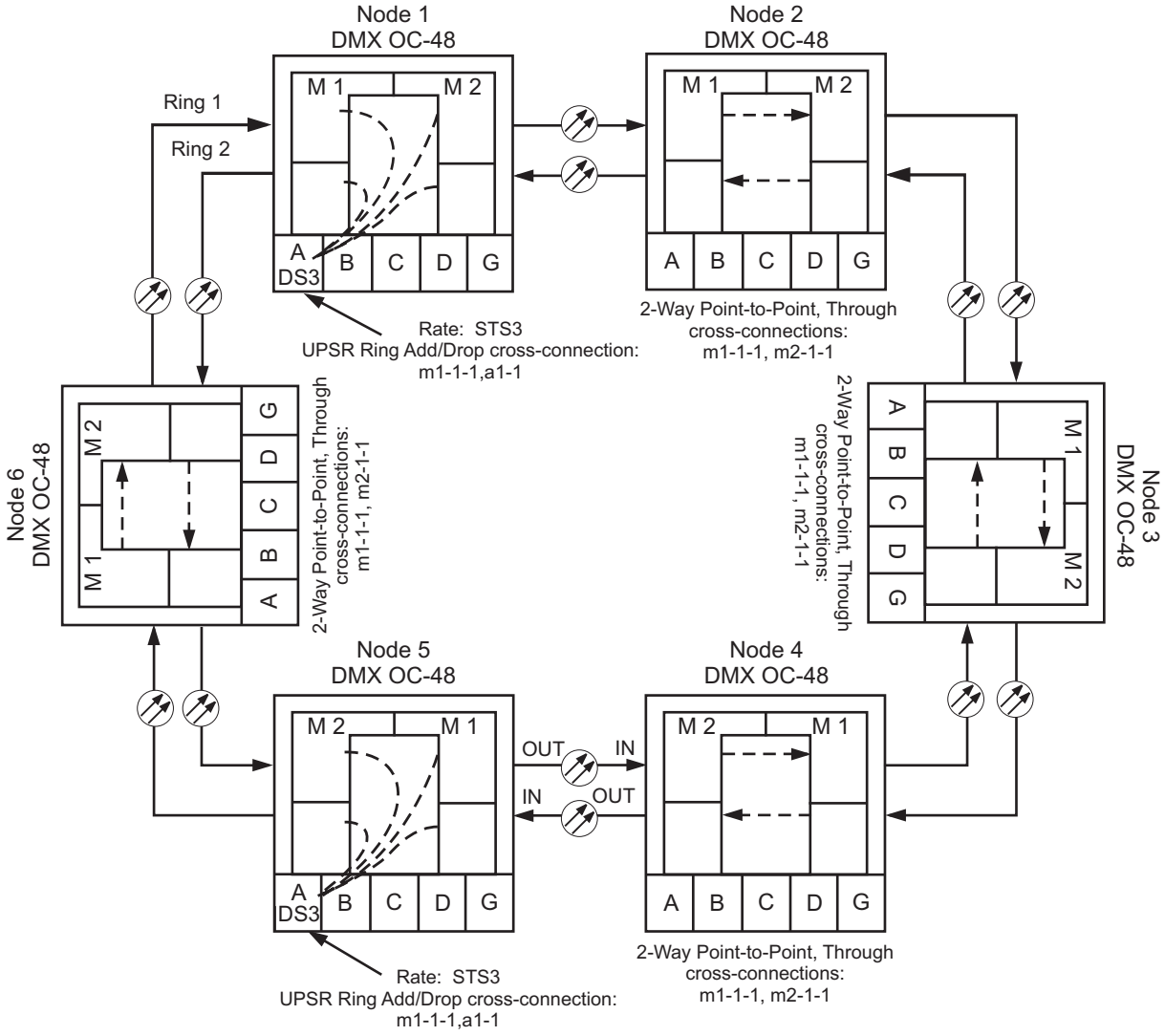
Figure 10-1 Path protected OC-48 ring network (DS1 to DS1) with VT1.5 cross-connections



DMX = 1665 Data Multiplexer

NC-DMX-189-2

Figure 10-2 Path protected OC-48 ring network (DS3 to DS3) with STS-1 cross-connections



DMX = 1665 Data Multiplexer

NC-DMX-190-2

Procedure 10-6: Make Function unit UPSR, hairpin, and Main to Function unit UPSR cross-connections

Overview

Use this procedure as an example to provision certain types of cross-connections on a single Alcatel-Lucent 1665 Data Multiplexer shelf. See *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306* for rates, types, restrictions, and allowable cross-connections. Note that E1 services require an STS-3c cross-connection.

This procedure is intended only to illustrate some of the many types of cross-connections, not to illustrate end-to-end service provisioning.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that the UPSR network configurations have been established using Procedure 9-9: "Establish subtending low-speed UPSR/BLSR" (p. 9-102), if required.
4. Determine the slots, circuit packs, ports, cross-connection types and cross-connection rates.
5. Obtain the work instructions for this procedure.

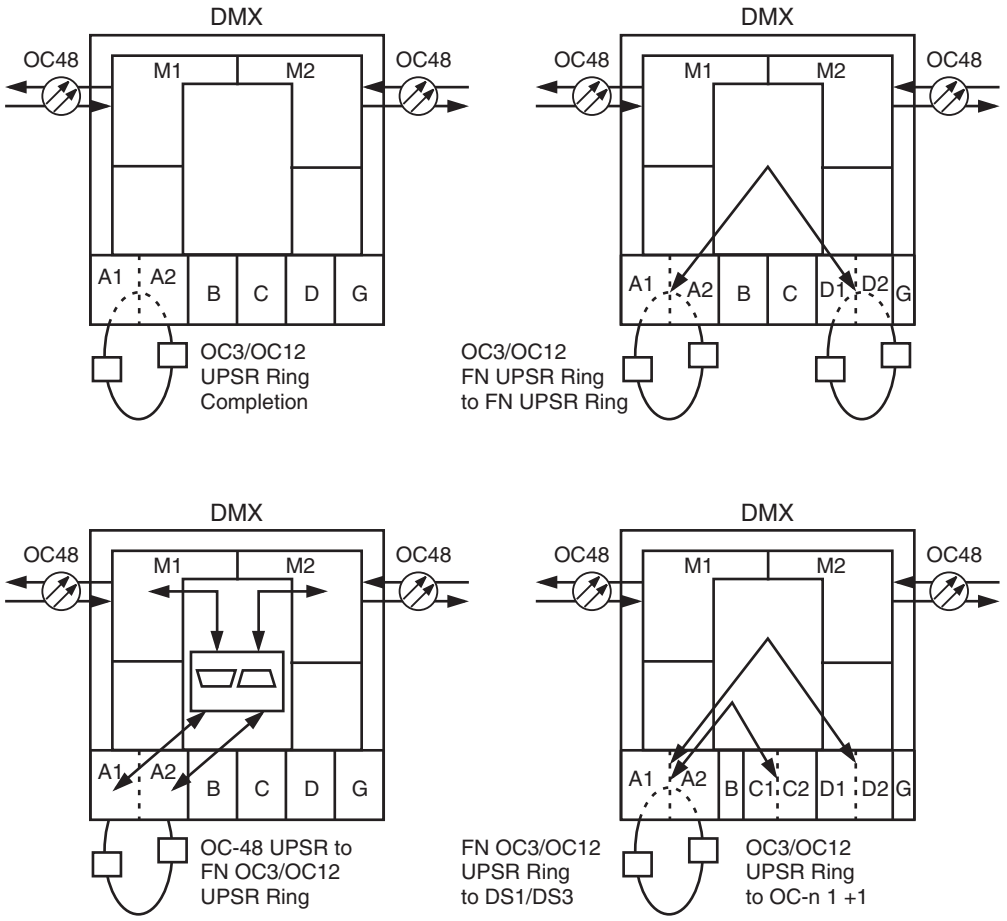
Steps

Complete the following steps to make the necessary cross-connections.

1 Refer to Figure 10-3, "Cross-Connection examples" (p. 10-24) for examples of some of the possible cross-connections. These examples show OC-48 optical rates in the Main slots and OC-3/12 optical rates in the Function/Growth slots. Other configurations with OC-192 in the Main slots and OC-3/12/48 in the Function/Growth slots are also applicable.

These examples are only brief descriptions of possible cross-connections. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306* for more information about allowable cross-connections.

Figure 10-3 Cross-Connection examples



DMX = 1665 Data Multiplexer

nc-dmx-179

2 On the System View menu, select **Administration** → **OSI Routing Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Routing Map* window opens.

3 Verify that the ring configurations are the same as specified in the work instructions.

Important! All differences between the work instructions and the actual ring configuration must be resolved before continuing.

4 From the System View menu of the subject Alcatel-Lucent 1665 DMX node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

5 Find the circuit pack, port, and tributaries being used for this service. Select the entity to view, then click the **Select** button at the bottom of the window. View the provisioning details for the selected entity and verify the entities are properly provisioned.

6 If the entities are not provisioned properly, use the procedures in this section to condition the circuit packs/ports for service.

7 From your work instructions, determine the cross-connections to be made for the service being established.

8 From the System View menu, select **View** → **Cross-Connections** to verify that the cross-connections specified on the work instructions may be made. If cross-connections are already assigned or improperly assigned, refer trouble to the provisioning organization. Improperly assigned cross-connections may have to be deleted, or a different timeslot must be selected for the service being selected.

9 Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*.

10 In the *Cross-Connection Wizard*, select **Create a new cross-connection**, select the type of cross-connection, then follow the wizard directions.

11 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

Alarms are not reported until the channel state transitions to in-service (IS) which happens only when a good signal is received. Cross-connections create connections to both sides of the ring. The channel state will transition once a good signal is received on either side of the ring.

12 Expand the details for the circuit pack being used. Select the required port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

13 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

- If the **Port Monitoring Mode** is *NMON* (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required port and then click **Select** at the bottom of the window.
  2. Under the **Fault Management** section, select *AUTO* (Automatic) for the **Port Monitoring Mode**.
  3. Click **Apply** at the bottom of the window.
  4. Click **Close** to exit the window, then repeat this procedure from Step 11.
- If the **Port Monitoring Mode** is *AUTO*:
  Check the connections at the local cross-connect panel (or equivalent connection point).

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 10-7: Make 1+1 (linear extension) cross-connections

Overview

Use this procedure to provision cross-connections at a Alcatel-Lucent 1665 Data Multiplexer shelf serving as a *terminating* node for a 1+1 optical extension. See *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306* for rates, types, restrictions, and allowable cross-connections. Note that E1 services require an STS-3c cross-connection.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that the 1+1 optical extension has been established using the procedures in Procedure 9-5: "Establish low-speed 1+1 linear optical extension" (p. 9-71).
4. Determine the cross-connection types, rates, and terminating nodes for the optical extension.
5. Obtain the work instructions for this procedure.

Steps

Complete the following steps to make the necessary cross-connections.

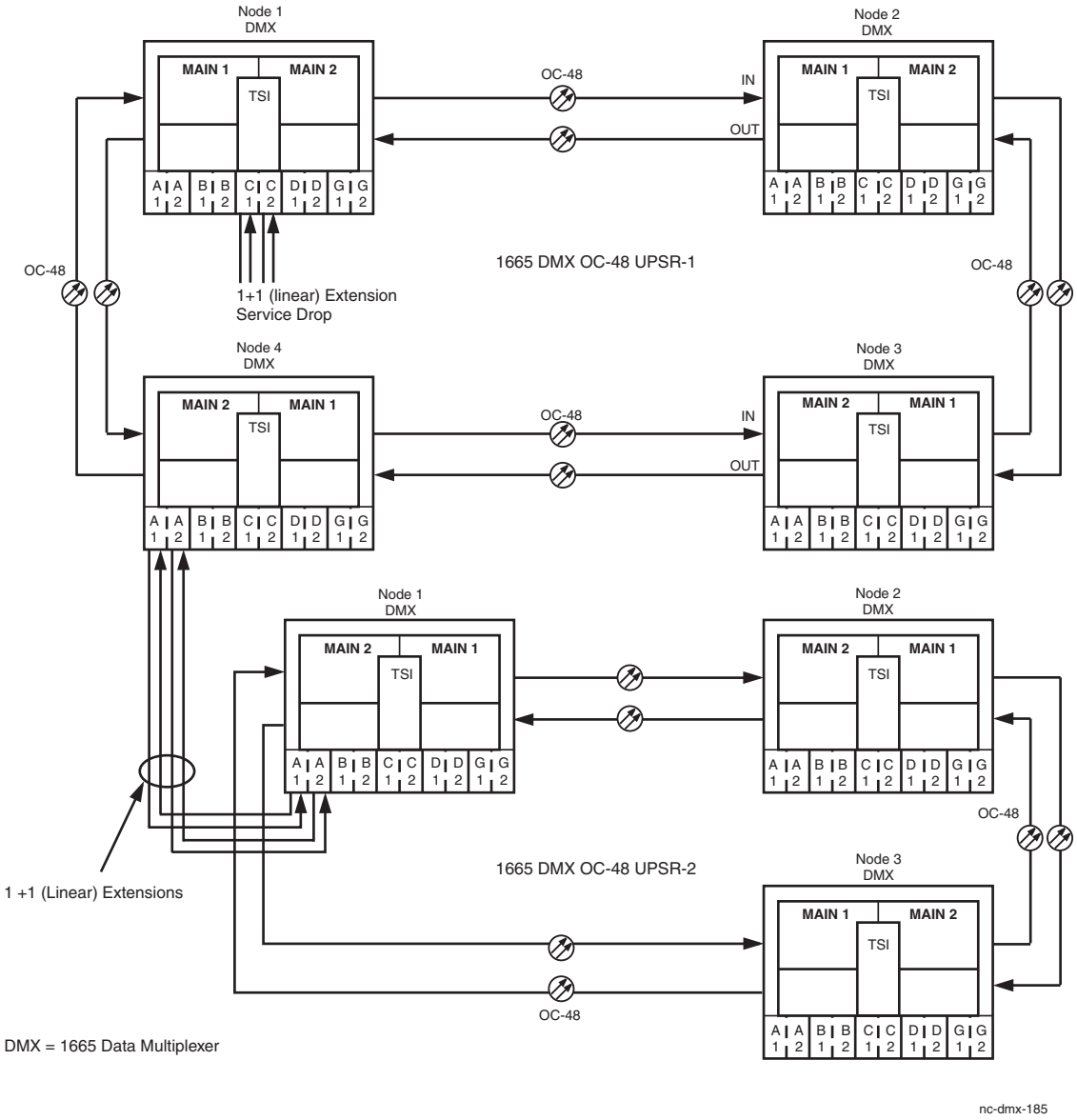
1 Use the *WaveStar*® CIT to log in to one of the Alcatel-Lucent 1665 DMX host nodes providing the 1+1 extension.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Refer to Figure 10-4, "Two Alcatel-Lucent 1665 DMX UPSRs connected in a 1+1 (linear extension)" (p. 10-28) for an example of two Alcatel-Lucent 1665 DMX UPSRs connected in a 1+1 (linear extension) configuration.

Note that this example depicts OC-48 optical line rates. Other applications and line rates are also possible.

Figure 10-4 Two Alcatel-Lucent 1665 DMX UPSRs connected in a 1+1 (linear extension)



3 On the System View menu, select **Administration → OSI Routing Map** to retrieve a node-to-node listing of every node on the Alcatel-Lucent 1665 DMX rings.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* window opens.

4 Verify that the network configuration is the same as specified in the work instructions.

Important! All differences between the work instructions and the actual ring configuration must be resolved before continuing.

5 From the work instructions, determine the terminating (add/drop) nodes at each end of the 1+1 optical extension.

6 One at a time, use the *WaveStar*® CIT to log in to each terminating node. From the System View menu at each node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

7 Find the circuit pack, port, and/or tributaries being used for this service. Select the entity to view, then click the **Select** button at the bottom of the window. View the provisioning details for the selected entity and verify the entities are properly provisioned.

8 If the entities are not provisioned properly, use the procedures in this chapter to condition the circuit packs/ports for service.

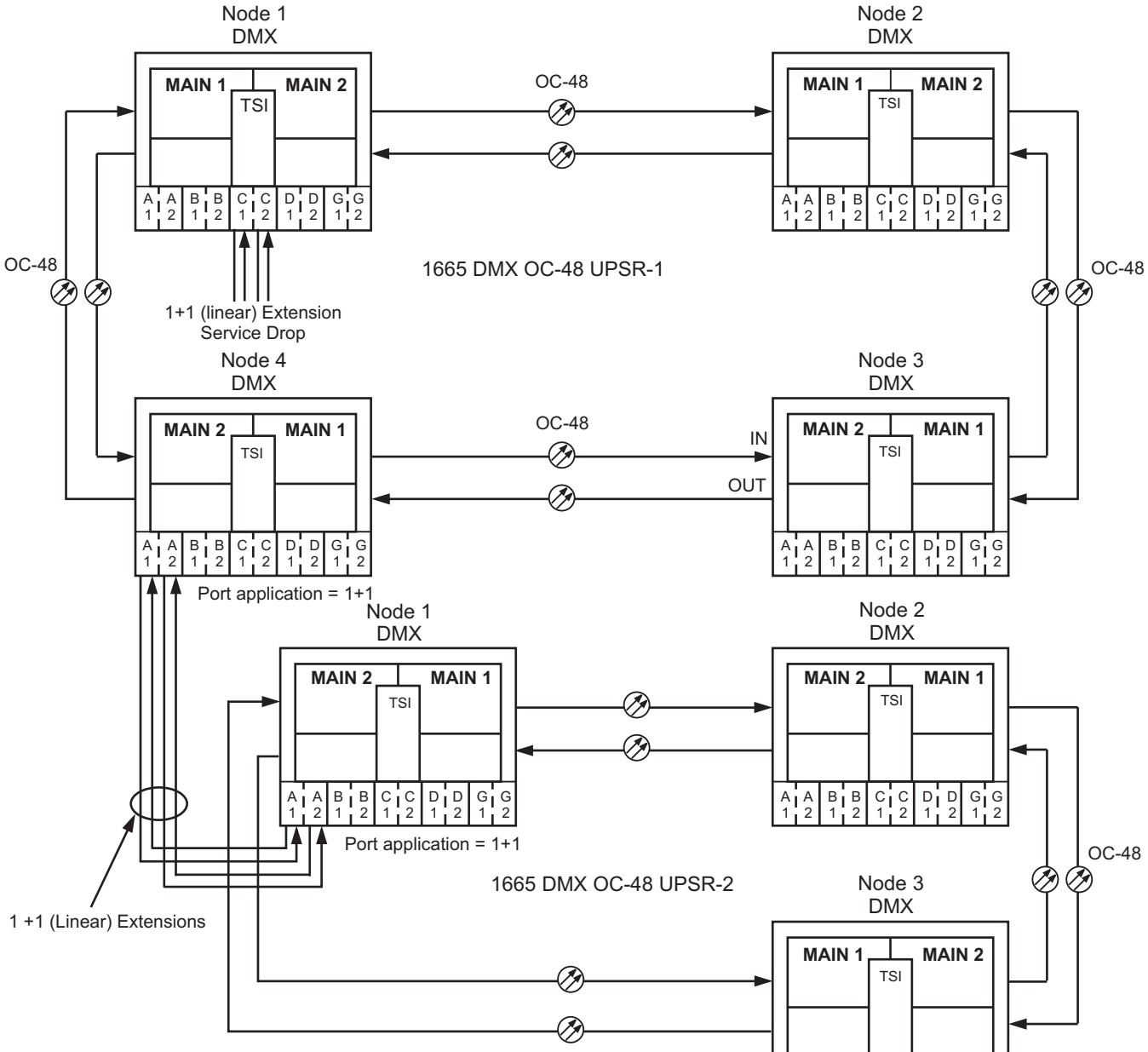
9 From your work instructions, determine the type of cross-connections to be made at each node for the service being established.

10 At each of the terminating nodes for the circuit being established, select **View** → **Cross-Connections** from the System View menu to verify that the cross-connections specified on the work instructions may be made. If cross-connections are already assigned or improperly assigned, refer trouble to the provisioning organization. Improperly assigned cross-connections may have to be deleted, or a different timeslot must be selected for the service being selected.

11 Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*. Use the *Cross-Connection Wizard* to provision the add/drop cross-connections at each terminating node serving the optical extension.

Figure 10-5, "1+1 STS-3c cross-connection examples" (p. 10-31) illustrates an example network with 1+1 STS-3c cross-connections at Alcatel-Lucent 1665 DMX nodes 1 and 4.

Figure 10-5 1+1 STS-3c cross-connection examples



AID Structure for OC-3

Function Group (a,b,c,d,g)	Slot 1,2	Port (1-x)	STS trib (1-3)	VTGroup (1-7, all)	VT1.5 (1-4, all)

AID Structure for OC-12

Function Group (a,b,c,d,g)	Slot 1,2	Port (1-x)	STS trib (1-12)	VTGroup (1-7, all)	VT1.5 (1-4, all)

Example aid for an OC-3 using Port 2, STS3c to Main trib #7: m1-1-7,a1-2-1

DMX = 1665 Data Multiplexer

NC-DMX-186-2

12 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connection has been made.

13 If other cross-connections are to be made, for example, from a terminating node in one ring to a terminating node in the other ring, refer to the appropriate procedures in this chapter to establish the particular service.

14 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

The provisioned cross-connections create connections to both sides of the ring. The channel state will transition once a good signal is received on either side of the ring. Note there will be channel states on the tributaries of the 1+1 interface as well.

15 Expand the details for the circuit pack being used. Select the required port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

16 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

- If the **Port Monitoring Mode** is *NMON* (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required port and then click **Select** at the bottom of the window.
  2. Under the **Fault Management** section, select *AUTO* (Automatic) for the **Port Monitoring Mode**.
  3. Click **Apply** at the bottom of the window.
  4. Click **Close** to exit the window, then repeat this procedure from Step 14.
- If the **Port Monitoring Mode** is *AUTO*:
  Check the connections at the local cross-connect panel (or equivalent connection point).

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 10-8: Make single-homed cross-connections

Overview

Use this procedure as an example for making cross-connections in Alcatel-Lucent 1665 DMX single-homed ring configurations. This procedure uses the CIT *Cross-Connection Wizard* commands to illustrate the provisioning of the cross-connections. The TL1 **`ent-crs-( )`** command may be used to perform the same provisioning.

See *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306* for rates, types, restrictions, and allowable cross-connections. Note that E1 services require an STS-3c cross-connection.

Although this example illustrates OC-3/12 rings single-homing to a OC-48 UPSR ring, the same procedure applies for OC-3/12/48 subtending rings to an OC-192 UPSR.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that the single-homed network has been established using the procedures in Procedure 9-6: "Establish single-homed network" (p. 9-79).
4. Determine the cross-connection types, rates, terminating nodes, host nodes, and pass-through nodes.
5. Obtain the work instructions for this procedure.

Steps

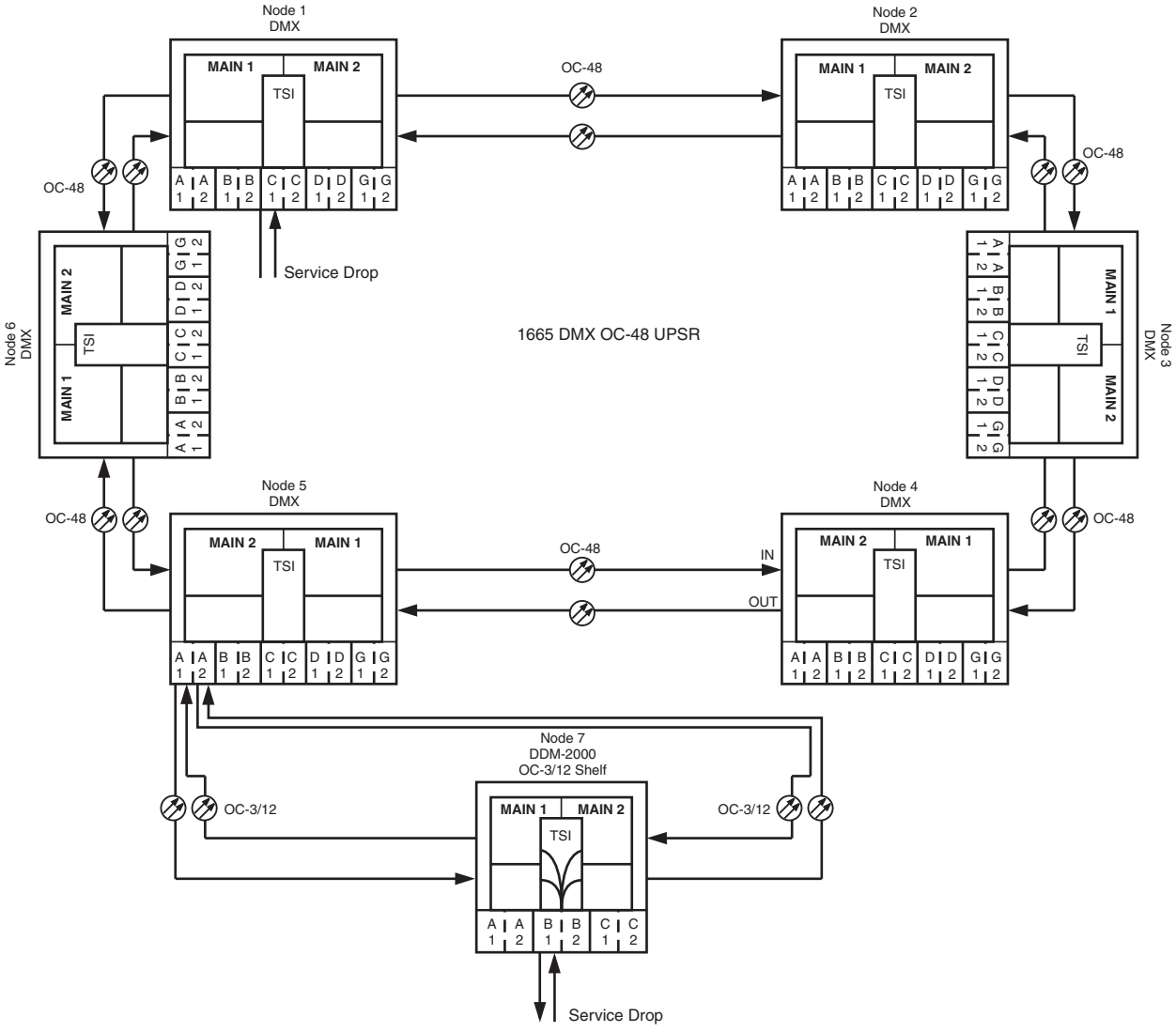
Complete the following steps to make the necessary cross-connections in single-homed configurations.

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX host node being used for single homing.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Refer to Figure 10-6, "Single-Homed Alcatel-Lucent 1665 DMX ring example" (p. 10-35) for an example of a simple single-homed Alcatel-Lucent 1665 DMX ring configuration. Note that this example uses an OC-48 ring as a backbone ring and OC-3/12 subtending nodes. Other applications may be at different optical rates.

Figure 10-6 Single-Homed Alcatel-Lucent 1665 DMX ring example



3 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node on this Alcatel-Lucent 1665 DMX ring.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

4 Verify that the ring configuration is the same as specified in the work instructions.

Important! All differences between the work instructions and the actual ring configuration must be resolved before continuing.

5 From the work instructions, determine the terminating (add/drop) nodes and the pass-through nodes for the particular service that is being established.

6 One at a time, use the *WaveStar*® CIT to log in to each node. From the System View menu at each node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

7 Find the circuit pack, port, and/or tributaries being used for this service. Select the entity to view, then click the **Select** button at the bottom of the window. View the provisioning details for the selected entity and verify the entities are properly provisioned.

8 Use product documentation for non Alcatel-Lucent 1665 DMX nodes in the network to verify proper circuit pack/port provisioning details.

9 If the entities are not provisioned properly, use the procedures in this section to condition the circuit packs/ports for service.

10 From your work instructions, determine the type of cross-connections to be made at each node for the service being established.

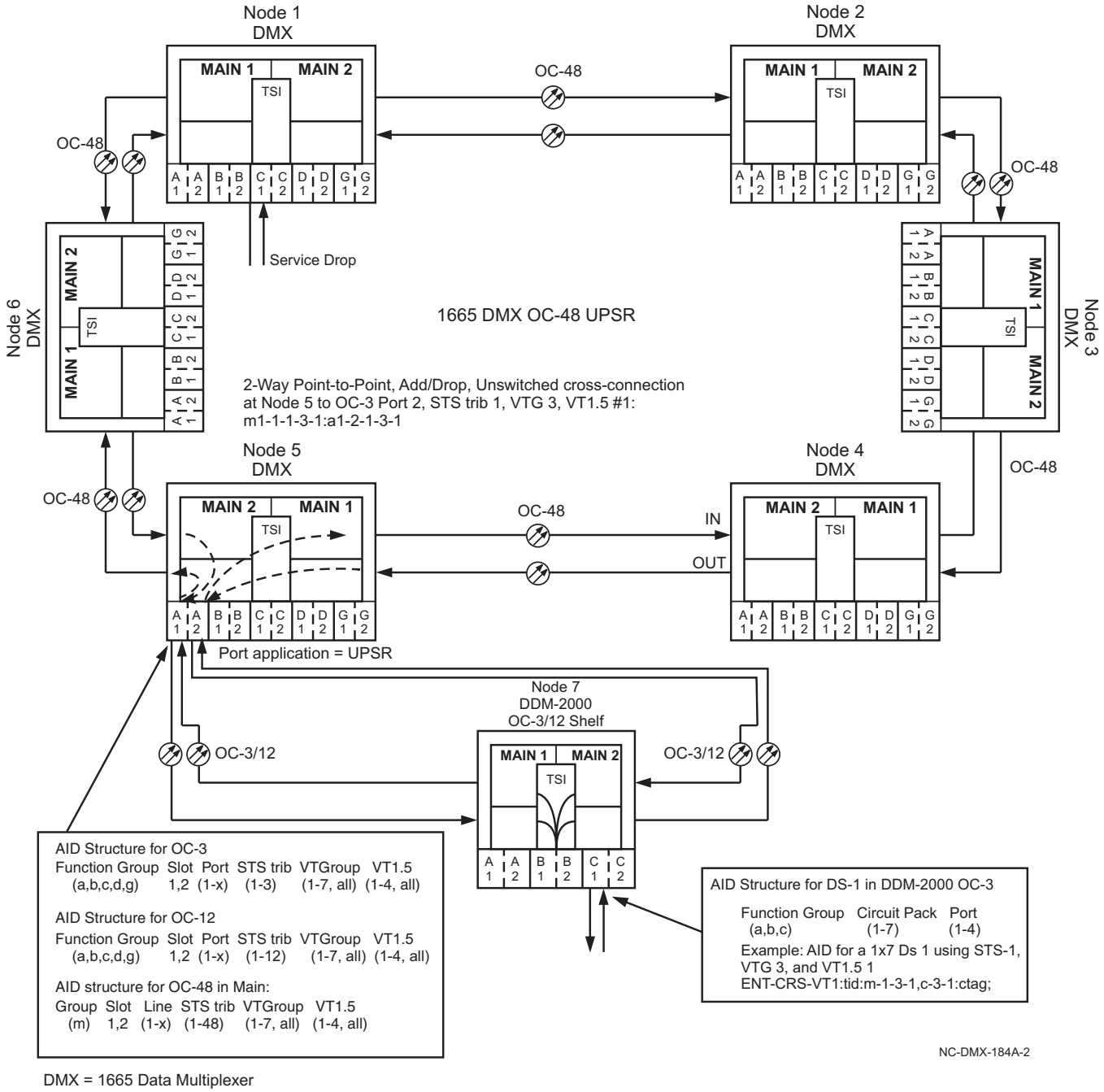
Figure 10-7, "Network with single-homed cross-connections example" (p. 10-38) illustrates an example network with single-homed cross-connections at Alcatel-Lucent 1665 DMX node 5 using **2-Way Point-to-Point, Add/Drop, Unswitched** cross-connections.

If the Main slots are *not* equipped with VLF OLIU circuit packs and the single homed configuration uses a port **Application** of UPSR, the cross-connection command at the host node must include the cross-connection channel application (**chappl**) parameter of unswitched. For this example at Node 5: **2-Way Point-to-Point, Add/Drop, Unswitched** (m1-1-1-3-1,a1-2-1-3-1).

If the Main slots are equipped with VLF OLIU circuit packs and the single homed configuration uses a port **Application** of UPSR, the cross-connection command at the host node may use the recommended cross-connection channel application (**chappl**) parameter of unswitched (**2-Way Point-to-Point, Add/Drop, Unswitched**) or the **Linear/Unprotected UPSR** cross-connection command with the Unprotected option.

Ports that connect the subtending ring to the Alcatel-Lucent 1665 DMX transport traffic over the Alcatel-Lucent 1665 DMX UPSR without any protection switching by the Alcatel-Lucent 1665 DMX nodes on the backbone ring. The end-of-path NEs [Node7 and Node1] do the path protection switching.

Figure 10-7 Network with single-homed cross-connections example



DMX = 1665 Data Multiplexer

Important! Cross-connections supporting DS3 services are STS-1 cross-connections. Cross-connections supporting DS1 services may be either STS-1 or VT1.5 cross-connections. Use VT1.5 cross-connections for DS1 services if you expect to cross connect only a portion of the VT1.5 signals in the STS-1 channel or if the

VT1.5s are coming from different places. If STS-1 cross-connections are made at a shelf, there is a fixed mapping of all 28 VT1.5 cross-connections to a specific shelf group.

11 Starting at the host node for the circuit being established, select **View** → **Cross-Connections** from the System View menu at each node in the ring to verify that the cross-connections specified on the work instructions may be made. If cross-connections are already assigned or improperly assigned, refer trouble to the provisioning organization. Improperly assigned cross-connections may have to be deleted, or a different timeslot must be selected for the service being selected.

12 Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*. Use the *Cross-Connection Wizard* at all *nonterminating* nodes in the network to provision pass-through cross-connections.

13 Use the *Cross-Connection Wizard* at the *terminating* (add/drop) nodes of the circuit being established to make the terminating cross-connections. (Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*.)

14 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connection has been made.

15 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

Alarms are not reported until the channel state transitions to in-service (IS) which happens only when a good signal is received. Cross-connections create connections to both sides of the ring. The channel state will transition once a good signal is received on either side of the ring.

16 Expand the details for the circuit pack being used. Select the required port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

17 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

- If the **Port Monitoring Mode** is *NMON* (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required port and then click **Select** at the bottom of the window.
  2. Under the **Fault Management** section, select *AUTO* (Automatic) for the **Port Monitoring Mode**.
  3. Click **Apply** at the bottom of the window.
  4. Click **Close** to exit the window, then repeat this procedure from Step 15.
- If the **Port Monitoring Mode** is *AUTO*:
  Check the connections at the local cross-connect panel (or equivalent connection point).

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 10-9: Make dual-homed cross-connections

Overview

Use this procedure as an example for making cross-connections in Alcatel-Lucent 1665 DMX dual-homed ring configurations. This procedure uses the CIT *Cross-Connection Wizard* commands to illustrate the provisioning of the cross-connections. The TL1 **`ent-crs-( )`** command may be used to perform the same provisioning.

See *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306* for rates, types, restrictions, and allowable cross-connections. Note that E1 services require an STS-3c cross-connection.

Although this example illustrates OC-3/12 rings dual-homing to a OC-48 UPSR ring, the same procedure applies for OC-3/12/48 subtending rings to an OC-192 UPSR.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the dual-homed network has been established using the procedures in Procedure 9-7: "Establish dual-homed network" (p. 9-87).
5. Determine the cross-connection types, rates, terminating nodes, pass-through nodes, and host nodes.

Steps

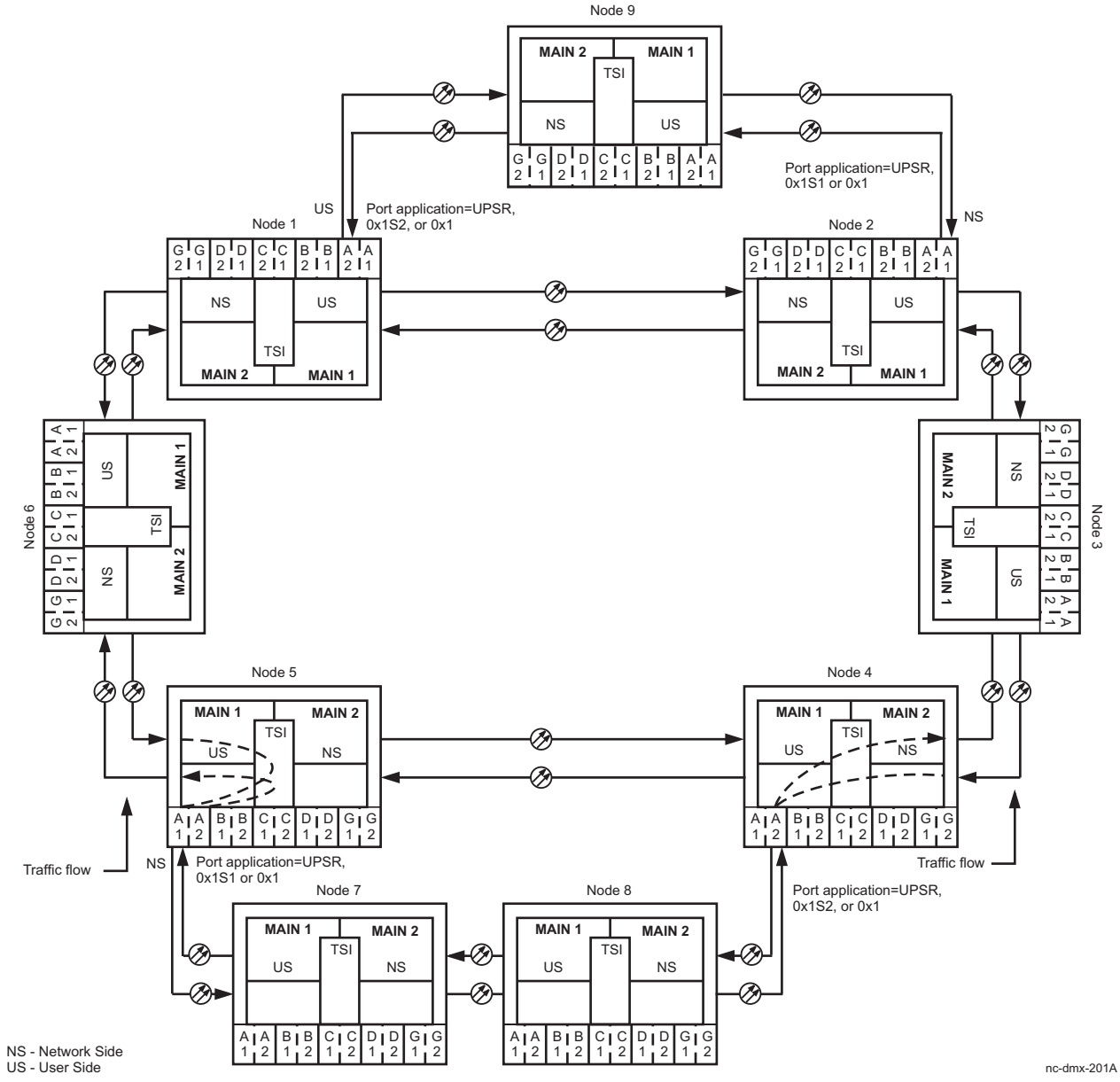
Complete the following steps to make the necessary cross-connections in dual-homed ring configurations.

1 Use the *WaveStar*® CIT to log in to one of the Alcatel-Lucent 1665 DMX host nodes being used for dual homing.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Refer to Figure 10-8, "Dual-Homed Alcatel-Lucent 1665 DMX ring example" (p. 10-42) for an example of a dual-homed Alcatel-Lucent 1665 DMX ring configuration. Note that this example uses an OC-48 ring as a backbone ring and OC-3/12 subtending nodes. Other applications may be at different optical rates.

Figure 10-8 Dual-Homed Alcatel-Lucent 1665 DMX ring example



3 **Important!** If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node on this Alcatel-Lucent 1665 DMX ring.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

4 Verify that the ring configuration, Alcatel-Lucent 1665 DMX host nodes, terminating nodes, and pass-through nodes are the same as specified in the work instructions.

Important! All differences between the work instructions and the actual ring configuration must be resolved before continuing.

5 One at a time, use the *WaveStar*® CIT to log in to each Alcatel-Lucent 1665 DMX node. From the System View menu at each node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

6 Find the circuit pack, port, and/or tributaries being used for this service. Select the entity to view, then click the **Select** button at the bottom of the window. View the provisioning details for the selected entity and verify the entities are properly provisioned.

7 Use product documentation for non Alcatel-Lucent 1665 DMX nodes in the network to verify proper circuit pack/port provisioning details.

8 If the entities are not provisioned properly, use the procedures in this document to provision the Alcatel-Lucent 1665 DMX circuit packs/ports for service.

9 **Important!** Cross-connections supporting DS3 services are STS-1 cross-connections. Cross-connections supporting DS1 services may be either STS-1 or VT1.5 cross-connections. Use VT1.5 cross-connections for DS1 services if you expect to cross connect only a portion of the VT1.5 signals in the STS-1 channel or if the VT1.5s are coming from different places. If STS-1 cross-connections are made at a shelf, there is a fixed mapping of all 28 VT1.5 cross-connections to a specific shelf group.

From your work instructions, determine the type of cross-connections to be made at each node for the service being established.

Refer to "Dual-homed cross-connections example (UPSR port application)" (p. 10-45) and "Dual-homed cross-connection example (0x1S1 and 0x1S2 or 0X1 port application)" (p. 10-47) at the end of this procedure.

10 Starting at one of the *host* nodes for the circuit being established, select **View** → **Cross-Connections** from the System View menu at each node in the ring to verify that the cross-connections specified on the work instructions may be made. If cross-connections are already assigned or improperly assigned, refer trouble to the provisioning organization. Improperly assigned cross-connections may have to be deleted, or a different timeslot must be selected for the service being selected.

11 Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*. Use the *Cross-Connection Wizard* at all non terminating nodes in the network to provision pass-through cross-connections.

12 Use the *Cross-Connection Wizard* at the host nodes to make the proper cross-connections. (Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*).

13 Use the *Cross-Connection Wizard* at the terminating (add/drop) nodes of the circuit being established to make the terminating cross-connections. (Select **Configuration** → **Cross-Connections** from the System View menu to start the *Cross-Connection Wizard*).

14 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connection has been made.

15 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

The provisioned cross-connections create connections to both sides of the ring. However, for unswitched STS cross-connections there are no channel states. For unswitched VT cross-connections there is an STS channel state (for the terminated STS). The channel state will transition once a good signal is received on either side of the ring. There will be channel states on the tributaries of the 0x1Sn interface.

16 Expand the details for the circuit pack being used. Select the required port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

17 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

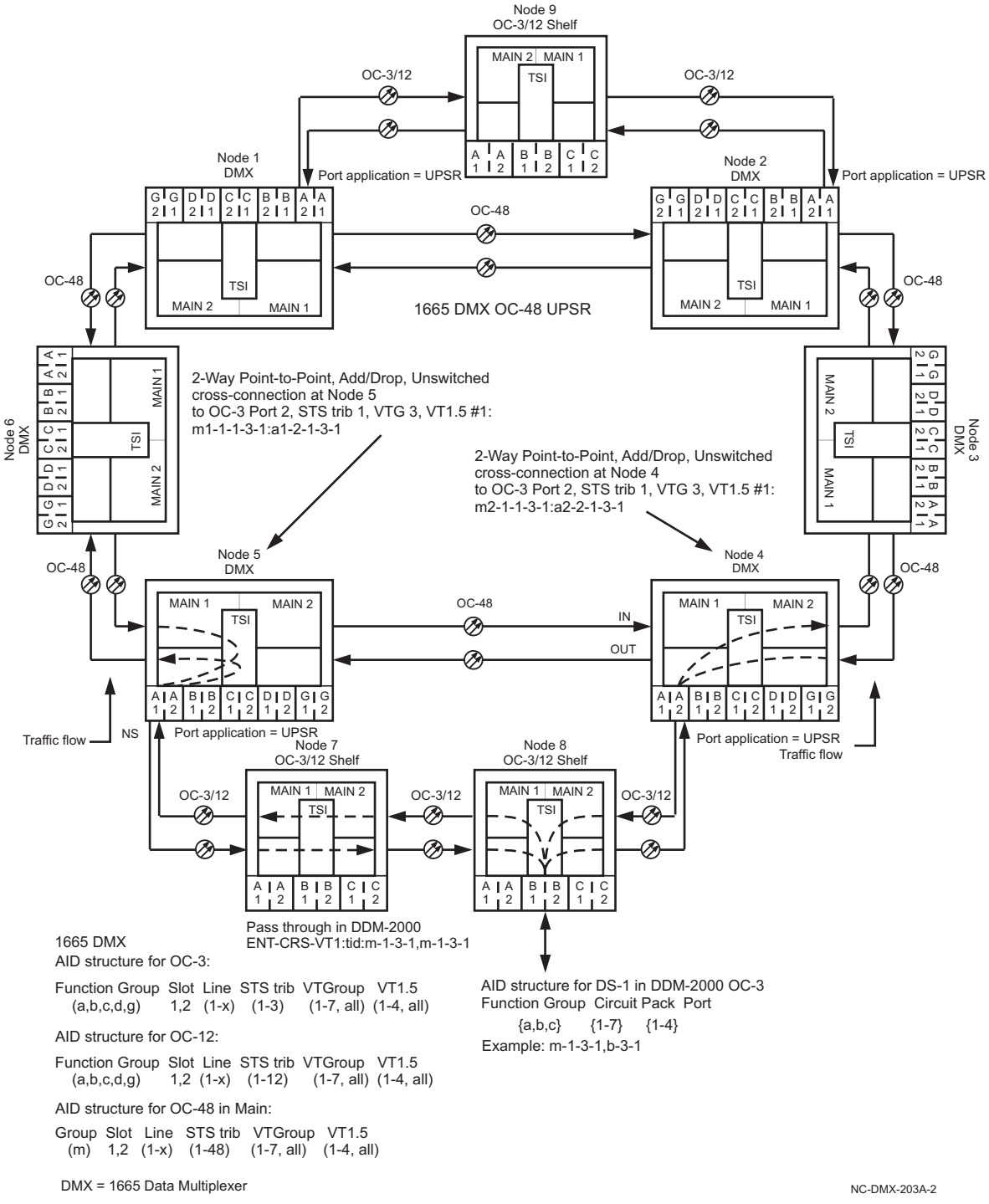
- If the **Port Monitoring Mode** is *NMON* (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required port and then click **Select** at the bottom of the window.
  2. Under the **Fault Management** section, select *AUTO* (Automatic) for the **Port Monitoring Mode**.
  3. Click **Apply** at the bottom of the window.
  4. Click **Close** to exit the window, then repeat this procedure from Step 15.
- If the **Port Monitoring Mode** is *AUTO*:
  Check the connections at the local cross-connect panel (or equivalent connection point).

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Dual-homed cross-connections example (UPSR port application)

The following example network shows dual-homed cross-connections at Alcatel-Lucent 1665 DMX node 4 and node 5.



The Application parameter of the ports used for the dual-homed connections is provisioned to UPSR.

If the Main slots are *not* equipped with VLF OLIU circuit packs and the dual homed configuration uses a port **Application** of UPSR, the cross-connection command at the host node must include the cross-connection channel application (**chappl**) parameter of unswitched. For this example:

2-Way Point-to-Point, Add/Drop, Unswitched at Node 5 (m1-1-1-3-1,a1-2-1-3-1)

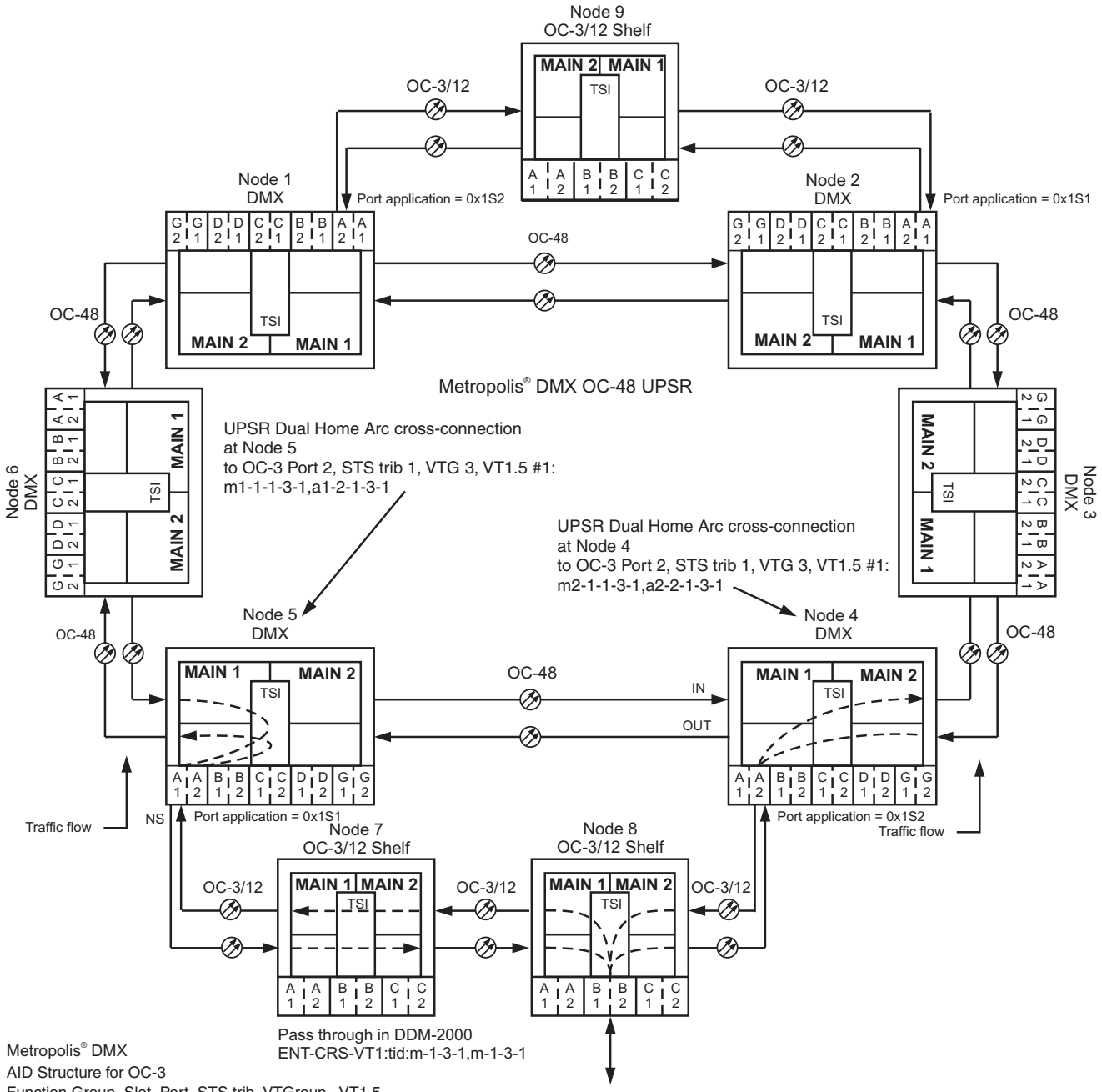
2-Way Point-to-Point, Add/Drop, Unswitched at Node 4 (m2-1-1-3-1,a2-2-1-3-1)

If the Main slots are equipped with VLF OLIU circuit packs and the dual homed configuration uses a port **Application** of UPSR, the cross-connection command at the host node may use the recommended cross-connection channel application (**chappl**) parameter of unswitched (**2-Way Point-to-Point, Add/Drop, Unswitched**) or the **Linear/Unprotected UPSR** cross-connection command with the Unprotected option.

Ports that connect the subtending ring to the Alcatel-Lucent 1665 DMX host nodes that are provisioned for UPSR protection, transport unswitched traffic over the Alcatel-Lucent 1665 DMX UPSR without any protection switching by the Alcatel-Lucent 1665 DMX nodes on the backbone ring. The end-of-path NEs (Node 8 and Node 9) do the path protection switching.

Dual-homed cross-connection example (0x1S1 and 0x1S2 or 0X1 port application)

The following example network shows dual-homed cross-connections at Alcatel-Lucent 1665 DMX node 4 and node 5 using 0x1Sn port applications.



Metropolis® DMX
AID Structure for OC-3

Function Group	Slot	Port	STS trib	VTGroup	VT1.5
(a,b,c,d,g)	1,2	(1-x)	(1-3)	(1-7, all)	(1-4, all)

AID Structure for OC-12

Function Group	Slot	Port	STS trib	VTGroup	VT1.5
(a,b,c,d,g)	1,2	(1-x)	(1-12)	(1-7, all)	(1-4, all)

AID structure for OC-48 in Main:

Group	Slot	Line	STS trib	VTGroup	VT1.5
(m)	1,2	(1-x)	(1-48)	(1-7, all)	(1-4, all)

AID structure for DS-1 in DDM-2000 OC-3

Function Group	Circuit Pack	Port
{a,b,c}	{1-7}	{1-4}

Example: ENT-CRS-VT1:tid:m-1-3-1,b-3-1:ctag;

DMX = Metropolis® DMX Access Multiplexer

NC-DMX-408

If the Main slots are *not* equipped with VLF OLIU circuit packs, the Application parameter of the ports used for the dual-homed connections is provisioned to 0x1S1 and 0x1S2. If the Main slots are equipped with VLF OLIU circuit packs, the Application parameter of the ports used for the dual-homed connections is provisioned to 0x1.

In this example, the Application parameter of the low-speed OC-n ports in FNA of node 5 is provisioned to 0x1S1. The Application parameter of the low-speed OC-n ports in FNA of node 4 is provisioned to 0x1S2.

If the Main slots are *not* equipped with VLF OLIU circuit packs, dual homed configurations using a port **Application** of 0x1Sn, use one-way cross-connection commands at the host nodes:

UPSR Dual Home Arc at Node 5 (m1-1-1-3-1,a1-2-1-3-1)

UPSR Dual Home Arc at Node 4 (m2-1-1-3-1,a2-2-1-3-1).

If the Main slots are equipped with VLF OLIU circuit packs, the cross-connection command at the host nodes may be **UPSR Dual Home Arc** or the **Linear/Unprotected UPSR** cross-connection command.

Traffic is transported without any protection switching by the Alcatel-Lucent 1665 DMX nodes on the backbone ring. The end-of-path NEs (Node 8 and Node 9) do the path protection switching.

Procedure 10-10: Bridge and roll cross-connections

Overview



NOTICE

Service-disruption hazard

Service interruption of up to 25 ms for STS or VT cross-connections may occur when an existing source is rolled to a new source. In cases involving roll procedures from Main 2 cross-connections to function slot ports, the service interruption may be as high as 200 ms.

Use this procedure to move traffic to another circuit path. Traffic can be moved from the existing tributary to another tributary on:

- the same set of interconnecting facilities.
- a different set of interconnecting facilities.

Traffic is moved using a coordinated sequence of bridging and rolling cross-connection legs at the terminating (add/drop) nodes and provisioning new cross-connections at pass-through nodes (UPSRs/BLSRs only).

At the head-end terminating node of a 1-way circuit, the existing add cross-connection leg is bridged to the new destination tributary allowing traffic to be added to the new circuit path.

At the tail-end terminating node of the 1-way circuit, the existing drop cross-connection leg is rolled to the new source tributary allowing traffic to be switched to the new circuit path.

For 2-way circuits, traffic in one direction of transmission is moved to the new circuit path, then the traffic in the opposite direction of transmission is moved to the new circuit path.

Bridging cross-connection legs

Cross-connection legs are bridged at the head-end terminating node of a 1-way circuit to move traffic to the new circuit path. Bridged cross-connection legs allow a single source tributary to be cross-connected to multiple destination tributaries at the same rate.

At the head-end terminating node of a 1-way circuit, the existing add cross-connection leg is bridged using *1-Way Point-to-Point* or *1-Way Path Protected Drop from a UPSR Ring* cross-connections.

Rolling cross-connection legs

Cross-connection legs are rolled at the tail-end terminating node of a 1-way circuit to switch traffic from the existing circuit path to the new circuit path. The source tributary of the existing drop cross-connection is switched to the new source tributary at the same rate.

Guidelines for provisioning the circuit ID parameter

When bridging/rolling cross-connection legs use the following guidelines to provision the circuit ID parameter.

- If an existing cross-connection has (or does not have) a circuitid value, and you want the new circuit to have a different or new circuitid value (circuitid=some_other_value), then specify circuitid=some_other_value in the bridge command. Then, specify the same circuitid=some_other_value in the roll command.
- If an existing cross-connection does *not* have a circuitid value, and you do *not* want the new circuit to have a circuitid value, then do *not* specify a circuitid value in the bridge command. Then, do *not* specify a circuitid value in the roll command.
- If an existing cross-connection has a circuitid value and you want the new circuit to have the same circuitid value, then specify the *same* circuitid value in the bridged cross-connection. Then, do *not* specify a circuitid value in the roll command.
- If an existing cross-connection has a circuitid value and you do *not* want the new circuit to have a circuitid value, then do not specify a circuitid value in the bridge command. Then, specify a null value for the circuitid (circuitid="") in the roll command.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Before you begin this procedure, you must:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the existing circuit path including terminating (add/drop) nodes, pass-through nodes (UPSRs/BLSRs only), cross-connections, and port/tributary addresses.
5. Verify that the work instructions specify the new circuit path including port/tributary addresses, cross-connections, and pass-through nodes (UPSRs/BLSRs only).

Steps

Complete the following steps to move traffic to another circuit path.

1 **Important!** For 2-way circuits, traffic in one direction of transmission is moved to the new circuit path, then the traffic in the opposite direction of transmission is moved to the new circuit path.

Using the work instructions, determine whether the circuit to be moved is 1-way or 2-way. If the circuit to be moved is 2-way, identify the direction of transmission to be moved first.

2 Identify and log in to the terminating (add/drop) nodes.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Identify and record the existing interconnecting facilities and the new interconnecting facilities (if required). If required, at the terminating (add/drop) nodes select **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the interconnecting facilities is not provided with the work instructions, it is recommended that you draw a simple diagram and list each node's TID.

4 **Important!** If the Port Monitoring Mode parameter is *AUTO*, the port automatically transitions to the *in service* state if a valid signal is detected and the port is monitored/alarmed. If the Port Monitoring Mode is *NMON*, the port is not monitored/alarmed, and the port will not automatically transition to the *in service* state if a valid signal is detected. No alarm reporting creates the possibility of service degradation or service outage if the new circuit path has a defect. If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

At each terminating (add/drop) and pass-through node (UPSRs/BLSRs only), select **View** → **Equipment** and verify that all circuit packs, pluggable transmission modules, ports, and protection groups have been provisioned at each node.

If required, refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional installation and provisioning.

5 **Important!** Before moving traffic to the new circuit path, new cross-connections must be created at pass-through nodes (UPSRs/BLSRs only).

If moving a...	Then at each pass-through node (UPSRs/BLSRs only)...
1-way circuit,	select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and create the required new **1-Way Point-to-Point, Through** cross-connection.
2-way circuit,	select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and create the required new **2-Way Point-to-Point, Through** cross-connection.

6 At each pass-through node (UPSRs/BLSRs only), select **View** → **Cross-Connections** to access the cross-connection list and verify that the required pass-through cross-connection was created.

7 **Important!** If the Tributary Monitoring Mode parameter is *AUTO*, the tributary automatically transitions to the *in service* state if a valid signal is detected and the tributary is monitored/alarmed. If the Tributary Monitoring Mode is *NMON*, the tributary is not monitored/alarmed, and the tributary will not automatically transition to the *in service* state if a valid signal is detected.

At each pass-through node (UPSRs/BLSRs only), select **View** → **Equipment** and verify the new Tributary parameters.

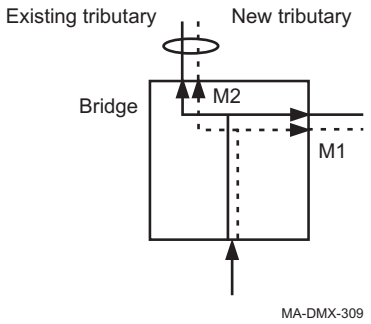
If required, select **Configuration** → **Equipment** and refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional provisioning.

8 **Important!** At the head-end terminating node of the 1-way circuit, the traffic to be moved must be bridged to the new tributary. In UPSRs, the traffic to be moved must be bridged to the same new tributary on Main/Function/Growth 1 and Main/Function/Growth 2.

At the head-end node of the 1-way circuit, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard*. Select **Bridge a cross-connection from a source to multiple destinations** and follow the directions to bridge the add cross-connection leg to the required new destination tributary(ies).

By definition, a "bridged" cross-connection is a 1-way cross-connection that shares the same input as a another cross-connection but has a different (unique) output. Creating a range of bridged cross-connections, creates multiple 1-way cross-connections, each with the same input and a different (unique) output.

The following figure shows an example of an add cross-connection leg bridged to new destination tributaries within a UPSR.



9 At the head-end node of the 1-way circuit, select **View** → **Cross-Connections** to access the cross-connection list and verify that the required add cross-connection leg was bridged to the new destination tributary(ies).

10 **Important!** If the Tributary Monitoring Mode parameter is *AUTO*, the tributary automatically transitions to the *in service* state if a valid signal is detected and the tributary is monitored/alarmed. If the Tributary Monitoring Mode is *NMON*, the tributary is not monitored/alarmed, and the tributary will not automatically transition to the *in service* state if a valid signal is detected.

At the head-end node of the 1-way circuit, select **View** → **Equipment** and verify the new Tributary parameters.

If required, select **Configuration** → **Equipment** and refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional provisioning.

11 At each terminating (add/drop) and pass-through node (UPSRs/BLSRs only), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

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NOTICE

Service-disruption hazard

Service interruption of up to 25 ms for STS or VT cross-connections may occur when performing the following roll procedures. In cases involving roll procedures from Main 2 cross-connections to Function slot ports, the service interruption may be as high as 200 ms.



NOTICE

Service-disruption hazard

Service outage will occur if all new cross-connections are not properly made before performing the following roll procedures.

Important! It is suggested that you use a Command Mode (cmdmde) of **NORM** when rolling a cross-connection input to a SONET interface. If the new input is being monitored and it is defective (for example: AIS-P, Loss of Pointer (LOP), STS UNEQ, B3 Signal Fail), the command will not complete. A Command Mode of **FRCD** allows the command to complete even if the new input is defective.

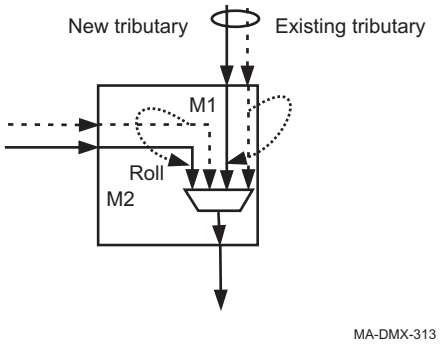
When rolling a cross-connection input to a non-SONET interface, the new input is not monitored and the Command Mode must be set to **FRCD**.

At the tail-end terminating node of the 1-way circuit, the traffic to be moved must be rolled to the new tributary. In UPSRs, the traffic to be moved must be bridged to the same new tributary on Main/Function/Growth 1 and Main/Function/Growth 2.

At the tail-end node of the 1-way circuit, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard*. Select **Roll a cross-connection from a source to a new source** and follow the directions to roll the drop cross-connection leg(s) to the required new source tributary(ies).

If a new Circuit Identifier (circuitid) is not specified, then the circuitid parameter value of the resultant cross-connection is inherited from the original cross-connection. If a new Circuit Identifier (circuitid) is null (circuitid=""), then the circuitid parameter value of the resultant cross-connection is cleared.

The following figure shows an example of drop cross-connection legs rolled to new source tributaries within a UPSR.



13 At the tail-end node of the 1-way circuit, select **View** → **Cross-Connections** to access the cross-connection list and verify that the required drop cross-connection leg(s) was rolled to the new source tributary(ies).

14 **Important!** If the Tributary Monitoring Mode parameter is *AUTO*, the tributary automatically transitions to the *in service* state if a valid signal is detected and the tributary is monitored/alarmed. If the Tributary Monitoring Mode is *NMON*, the tributary is not monitored/alarmed, and the tributary will not automatically transition to the *in service* state if a valid signal is detected.

At the tail-end node of the 1-way circuit, select **View** → **Equipment** and verify the new Tributary parameters.

If required, select **Configuration** → **Equipment** and refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional provisioning.

15 If moving a 2-way circuit, repeat Step 8 through Step 14 to move the traffic in the opposite direction of transmission to the new circuit path; otherwise, continue with the next step.

16 At each terminating (add) and pass-through node (UPSRs/BLSRs only), select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard*. Select **Delete leg(s) of an existing cross-connection** and follow the directions to delete the original cross-connections in the original circuit path.

END OF STEPS

Procedure 10-11: Establish dual ring interworking (DRI) connections

Overview

This procedure provides an example for configuring basic dual ring interworking connections (DRI). See Figure 10-9, "Example of final DRI configuration" (p. 10-60) for an example.

This procedure provides examples of the steps involved in making the proper cross-connections at the DRI interconnecting nodes. It is not intended for establishing complete service from an end node to an end node (for example, from Node 1 to Node 6). Although, once the DRI connections are made at the interconnecting nodes, establishing service from an end node to an end node only requires the proper pass-through cross-connections at intermediate nodes and add/drop cross-connections in the terminating end nodes.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Important! The following procedure is based on a hypothetical example. You can use this example procedure to apply the basic concepts to the procedure you want to perform.

This procedure assumes that the individual rings being connected have been established and are working properly.

Before you begin

Before you begin this procedure, you must:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Identify the nodes in the network and determine which nodes are the interconnecting DRI nodes.
5. Identify which Function slots in the DRI nodes are going to be used to make the connections.
6. Determine the cross-connections to be used.
7. Be able to log in to the NE with the *WaveStar*® CIT and be familiar with the functions of the *WaveStar*® CIT.

Steps

Complete the following steps to perform DRI connections.

1 Use the *WaveStar*® CIT to log in to the nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu at each node, select Administration → OSI Neighbor Map to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Neighbor Map* window opens.

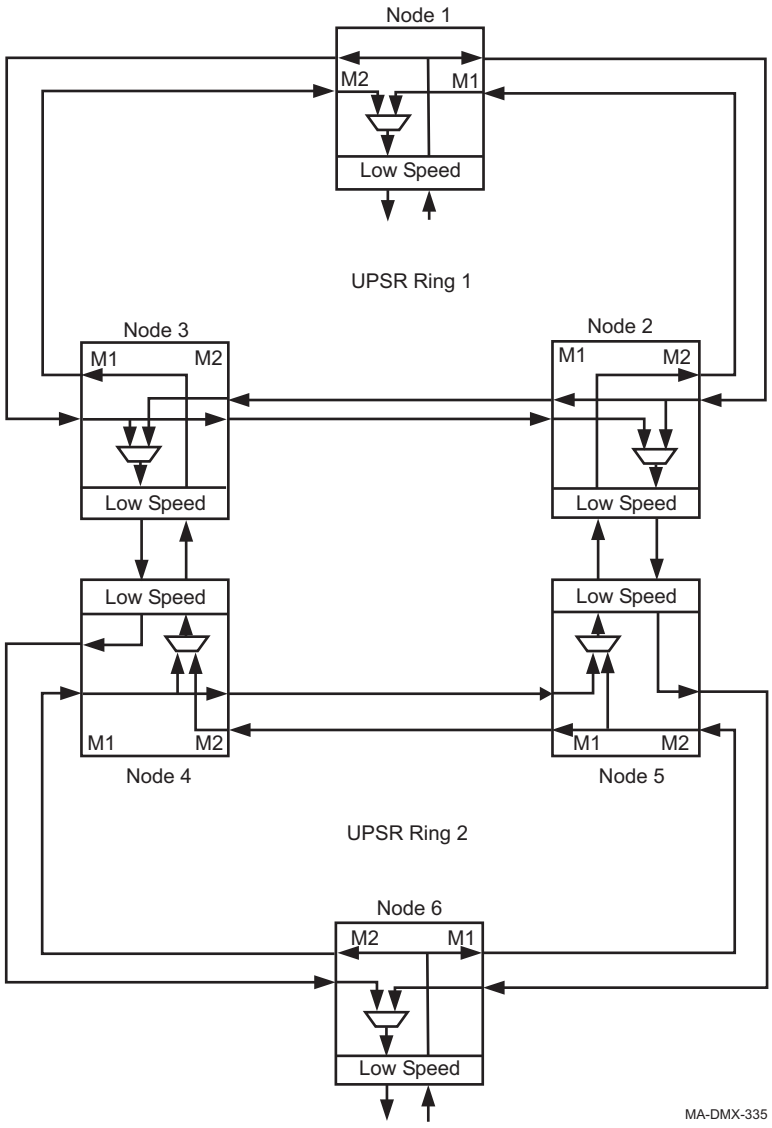
See Figure 10-9, "Example of final DRI configuration" (p. 10-60) for an example of a final configuration.

In this example, two UPSR rings are being interconnected in a DRI configuration using STS-1 cross-connections between two pairs of interconnecting nodes (Nodes 2 and 3, and Nodes 4 and 5), one pair in each ring. Note that cross-connections in this release are STS cross-connections.

In this figure the main ports are on the UPSR and the low-speed ports are used as the add/drop ports. The add/drop ports may be UPSR, 1+1, 0x1S1 or 0xS2, or BLSR OC-N ports, or an electrically protected EC-1 port. For this example, we assume the low speed ports are configured as UPSR ports.

This example is only one of many possible configurations. In this example one could reverse the roles of the main OLIUs and the low speed circuit packs at any of the nodes to form another configuration. Also, a low speed UPSR could be used in place of the Main OLIUs at any of the interconnecting nodes.

Figure 10-9 Example of final DRI configuration



3 From the System View menu, select **View** → **Equipment** and verify that all circuit packs have been installed and ports have been provisioned and connected at each interconnecting DRI node. For example, at nodes 2, 3, 4, and 5 in Figure 10-9, “Example of final DRI configuration” (p. 10-60).

Important! Before performing the DRI cross-connections in this procedure, the optical or electrical interconnection between the DRI nodes must be completed.

If circuit packs have not been installed, the ports have not been provisioned, or the proper interconnection application has not been performed, use the procedures in this manual to install, provision, and connect the required circuit pack ports. The add/drop ports may be UPSR, 1+1, or BLSR OC-n ports, or electrically protected EC-1 ports.

4 From the System View menu at each DRI node, select **Configuration** → **Cross-Connections** to start the *Cross-Connection Wizard*.

Result: The *Cross-Connection Wizard* screen opens.

5 Select **Create a new cross-connection**, then click **Next** at the bottom of the screen.

6 Select **UPSR Dual Ring Interworking**, then click **Next** at the bottom of the screen.

7 Use the **Select** button to choose the UPSR and then the Add/Drop Tributary. **Click** Next to continue.

Note the direction of cross-connections (East or West) in the *Cross-Connection Wizard*. For example, see Figure 10-10, “Example cross-connections at node 3” (p. 10-61) and Figure 10-11, “Example cross-connections at node 2” (p. 10-62) for the cross-connections at Nodes 2 and 3.

Figure 10-10 Example cross-connections at node 3

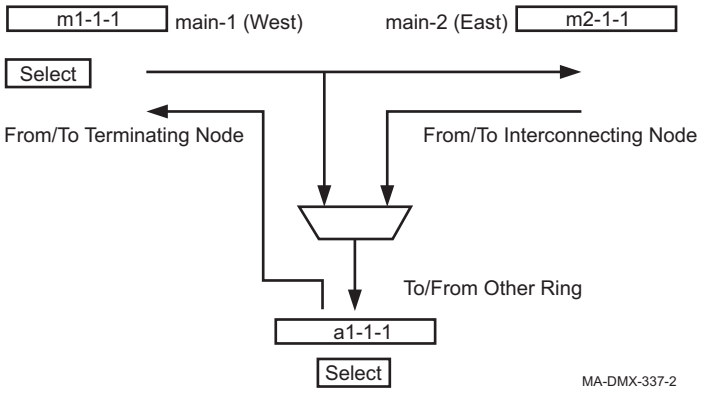
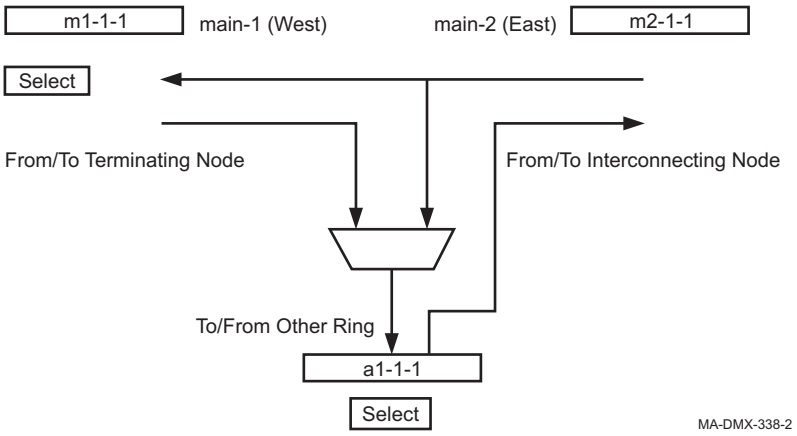


Figure 10-11 Example cross-connections at node 2



8 Enter a **Circuit Identifier** if required. Verify the cross-connections, then click **Finish** to execute the command.

9 Repeat these steps from Step 4 to make the cross-connections at each DRI node.

See Figure 10-12, "Example cross-connections for DRI with UPSR protected OC-n add/drop ports" (p. 10-63) for an example of the cross-connections that are made at each node to complete the final configuration as shown in Figure 10-9, "Example of final DRI configuration" (p. 10-60). The example uses TL1 commands to illustrate the different cross-connections that are made when using the *Cross-Connection Wizard*. The **View** → **Cross-Connections** command at each of the DRI nodes shows the individual cross-connections made from the *Cross-Connection Wizard*.

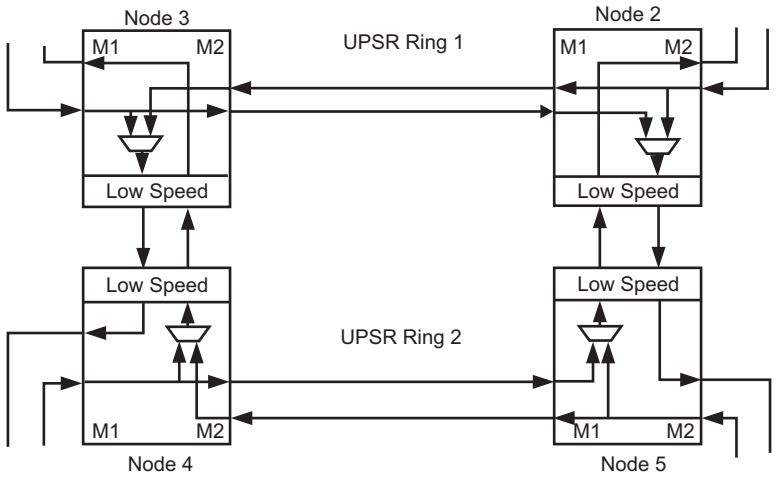
Cross-connections are a combination of *1waypr* and *1way*. Refer to Figure 10-13, "Basic UPSR DRI cross-connections with UPSR protected OC-n add/drop port" (p. 10-63) through Figure 10-17, "Basic UPSR DRI cross-connections with 0X1Sn (0x1) protected OCn add/drop port" (p. 10-65) for examples of different add/drop port configurations in the basic UPSR DRI application.

END OF STEPS

Figure 10-12 Example cross-connections for DRI with UPSR protected OC-n add/drop ports

ent-crs-rr:Node3:m1-1-1,a1-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node3:m1-1-1,a2-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node3:m1-1-1,m2-1-1:ctag::1way;
ent-crs-rr:Node3:a1-1-1,m1-1-1:ctag::1waypr,a2-1-1;

ent-crs-rr:Node2:m1-1-1,a1-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node2:m1-1-1,a2-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node2:m2-1-1,m1-1-1:ctag::1way;
ent-crs-rr:Node2:a1-1-1,m2-1-1:ctag::1waypr,a2-1-1;

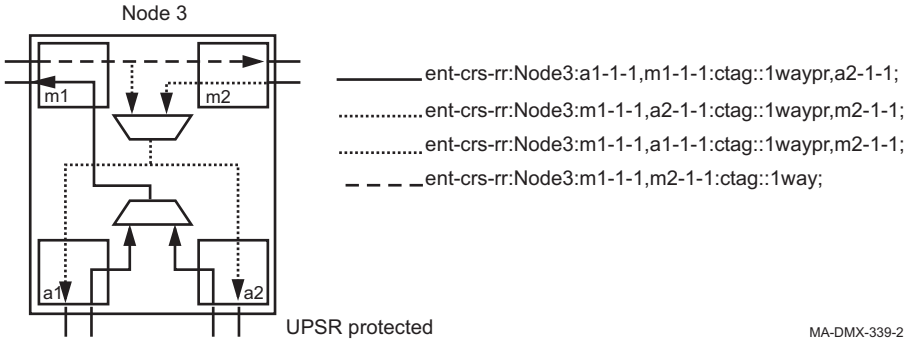


ent-crs-rr:Node3:m1-1-1,a1-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node3:m1-1-1,a2-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node3:m1-1-1,m2-1-1:ctag::1way;
ent-crs-rr:Node3:a1-1-1,m1-1-1:ctag::1waypr,a2-1-1;

ent-crs-rr:Node5:m1-1-1,a1-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node5:m1-1-1,a2-1-1:ctag::1waypr,m2-1-1;
ent-crs-rr:Node5:m2-1-1,m1-1-1:ctag::1way;
ent-crs-rr:Node5:a1-1-1,m2-1-1:ctag::1waypr,a2-1-1;

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Figure 10-13 Basic UPSR DRI cross-connections with UPSR protected OC-n add/drop port



MA-DMX-339-2

Figure 10-14 Basic UPSR DRI cross-connections with EC-1 add/drop port

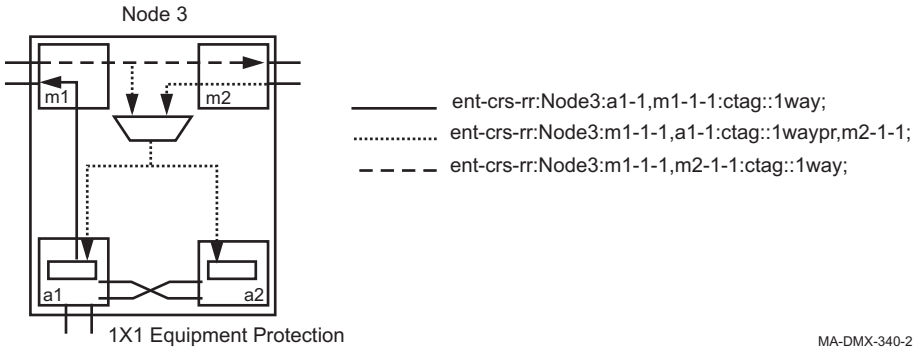


Figure 10-15 Basic UPSR DRI cross-connections with 1+1 protected OC-n add/drop port

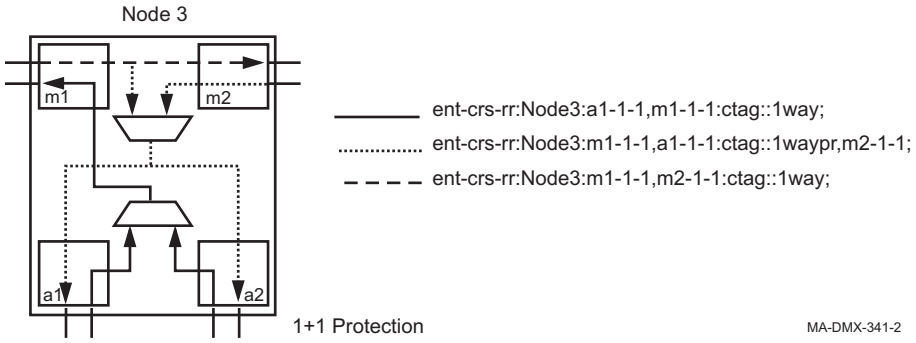


Figure 10-16 Basic UPSR DRI cross-connections with BLSR protected OC-n add/drop port

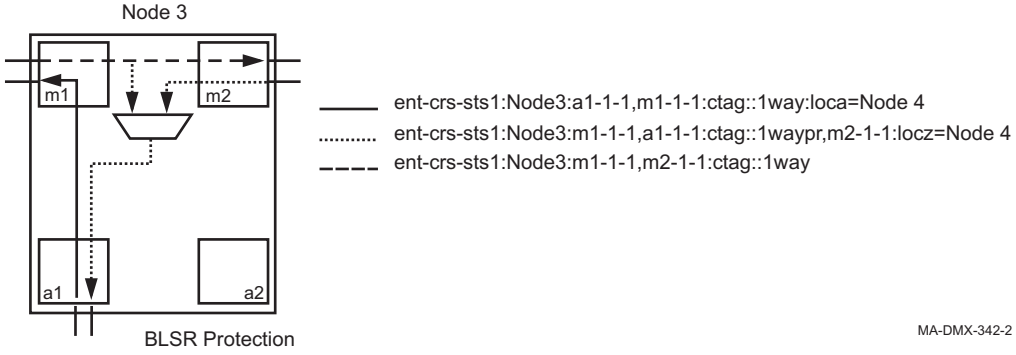
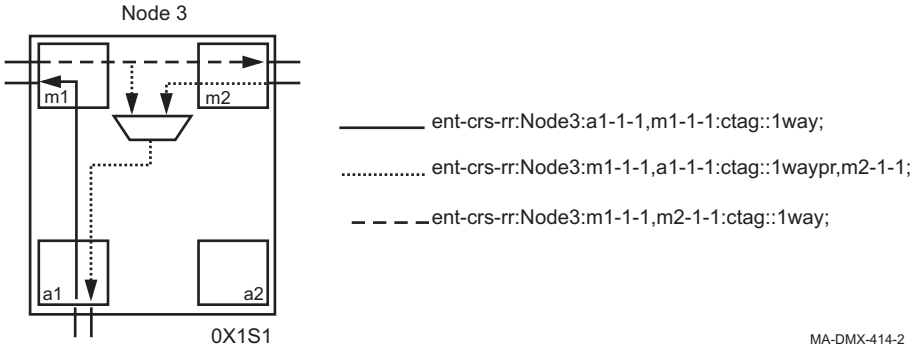


Figure 10-17 Basic UPSR DRI cross-connections with 0X1Sn (0x1) protected OCn add/drop port



Procedure 10-12: Provision DS1/DS3 locked cross-connections on a UPSR

Overview

Use this procedure as an example for provisioning locked VT1.5 or STS-1 cross-connections. Locked cross-connections consist of a cross-connection between a DSn port and a tributary on one side only of a UPSR ring, for example, a1-1-3-4 to m1-1-2-3-4. Note that the AIDs are that of a ring channel (a1, m1).

This procedure uses examples for DS1 and DS3 type cross-connections to illustrate the steps involved in cross-connections in a single UPSR ring configuration. This procedure uses the CIT *Cross-Connection Wizard* commands to illustrate the provisioning. The same provisioning may be made using the TL1 **`ent-crs-( )`** command.

Additional considerations when provisioning locked cross-connection:

- Cross-connections are 2-way using two 1-way cross-connections performed by the **DSn Locked** cross-connection type from the CIT *Cross-Connection Wizard*.
- In the example (a1-1-3-4 to m1-1-2-3-4), for systems *not* equipped with Very Large Fabric (VLF) OLIU main circuit packs, cross-connections on the same companion VT timeslot within the same STS of a locked cross-connection are denied to the other side (for example, m2-1-2-3-4 to b2-2-2-3-4). However, the same ring timeslot can be reused on non-adjacent spans. For systems equipped with VLF OLIU main circuit packs, there is no restriction. The companion VT timeslot within the same STS of a locked cross-connection is allowed to the other side.

  For systems *not* equipped with VLF OLIU main circuit packs, cross-connections, at the local node, of the same companion STS to the other side are also denied (for example, m2-1-2 to c1-2). For systems equipped with VLF OLIU main circuit packs, cross-connections of the same companion STS to the other side is allowed.

  Cross-connections of different timeslots within the same STS *are* accepted (for example, m2-1-2-7-4 to b2-2-2-7-4).

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

3. Verify that you have the work instructions for this procedure stating the circuit pack and port options to be set, the pass-through and terminating end nodes, and cross-connections being made.
4. Verify the network has been established and that all necessary circuit packs and port options have been provisioned for the service being established.

Steps

Perform the following steps to make the necessary locked cross-connections.

1 Connect the PC and establish a *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Log in to any node in the network and retrieve a map of the network which lists all the systems and how they are connected to each other. From the System View menu select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map**.

3 Verify that the system configuration is the same as specified on the work order or circuit order.

4 From work order or circuit order, determine the terminating (drop) nodes and the pass-through nodes for the service being established.

Important! In ring configurations, you should use the following general rules in establishing cross-connections in each ring.

Cross-Connect Rules

1. All cross-connections to/from the same STS-1 timeslot must be provisioned the same, either all VT1.5 or STS-1.
2. If all 28 VT1.5s (DS1s) in an STS-1 are being passed through at a node in a VT1.5 path-switched ring, then the cross-connection may be provisioned as either a pass-through STS-1 or VT1.5. However, if you are dropping VT1.5s from the pass through node in the future or monitoring VT path faults, you should provision the pass-throughs as VT1.5 cross-connections.
3. For systems *not* equipped with VLF OLIU main circuit packs, if an STS, or a VT within an STS, on one side of the ring is connected as a locked cross-connection, no cross-connections involving the same STS number on the opposite side are allowed.

5 Log in to each node in the network and verify that each shelf is properly equipped for the service being established. From the System View menu select **View** → **Equipment**.

6 From work order or circuit order, determine the cross-connections to be made at each node associated with the service to be established. See Figure 10-18, "DS1 locked cross-connections on a UPSR (unprotected)" (p. 10-70), Figure 10-19, "DS3 locked cross-connections on a UPSR (unprotected)" (p. 10-71) and Figure 10-20, "DS3 locked cross-connections on a UPSR (protected externally)" (p. 10-72) for DS1/DS3 cross-connection examples.

Important! Cross-connections supporting DS3 services are STS-1 cross-connections. Cross-connections supporting DS1 services may be either STS-1 or VT1.5 cross-connections. Use VT1.5 cross-connections for DS1 services if you expect to cross connect only *some* of the VT1.5 signals in the STS-1 channel. If STS-1 cross-connections are made at a shelf, there is a fixed mapping of all 28 VT1.5 cross-connections to a specific shelf group.

7 Starting at one of the terminating nodes for the circuit being established, at each node in the ring select **View** → **Cross-Connections** from the System View menu to verify that the cross-connections specified on the work order or circuit order may be made. If the cross-connections are already assigned to another service or improperly assigned, refer trouble to the organization responsible for facility design. Improperly assigned cross-connections may have to be deleted.

8 At all non-terminating nodes in the network, provision pass-through cross-connections. From the System View menu select **Configuration** → **Cross-Connections**, then use the *Cross-Connection Wizard* to make the cross-connections. Select **2-Way Point-to-Point, Through** for pass through cross-connections.

9 At the terminating (add/drop) nodes of the circuit being established, establish the terminating cross-connections. From the System View menu select **Configuration** → **Cross-Connections**, then use the *Cross-Connection Wizard* to make the **Locked DSn** cross-connections.

Important! The channel mode provisioning feature provides In-Service, Automatic, or Not Monitored states for VT and STS channels similar to the port modes for DS1 and DS3 ports. At installation, or when a cross-connection is made to a point of termination, the channel is in the Automatic mode and alarming is suppressed until a valid signal is received. The channel must receive a good signal from the side of the ring being used to cause the channel to transition to in-service.

Locked DSn cross-connections may be made between OLIUs and DS1 or DS3 interfaces, but not TMUX interfaces. Also, remember that the AIDs of the locked cross-connections are that of a ring channel, for example *m1*-1-4-1-4 or *g2*-2-1.

10 Verify that the proper connection has been made. From the System View menu select **View** → **Cross-Connections**. If changes are required, return to the *Cross-Connection Wizard*d to make them.

11 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

Alarms are not reported until the channel state transitions to in-service (IS) which happens only when a good signal is received. Since there is a connection only to one side of the UPSR ring, no alarms are reported until all upstream connections are correct.

12 Expand the details for the circuit pack being used. Select the required DS1/DS3 port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

13 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

- If the Port Monitoring Mode is *NMON* (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required DS1/DS3 port and then click **Select** at the bottom of the window.
  2. Under the **Fault Management** section, select *AUTO* for the **Port Monitoring Mode**.
  3. Click **Apply** at the bottom of the window.
  4. Click **Close** to exit the window, then repeat this procedure from Step 11.
- If the **Port Monitoring Mode** is *AUTO*:
  Check the connections at the local cross-connect panel (or equivalent connection point).

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Figure 10-18 DS1 locked cross-connections on a UPSR (unprotected)

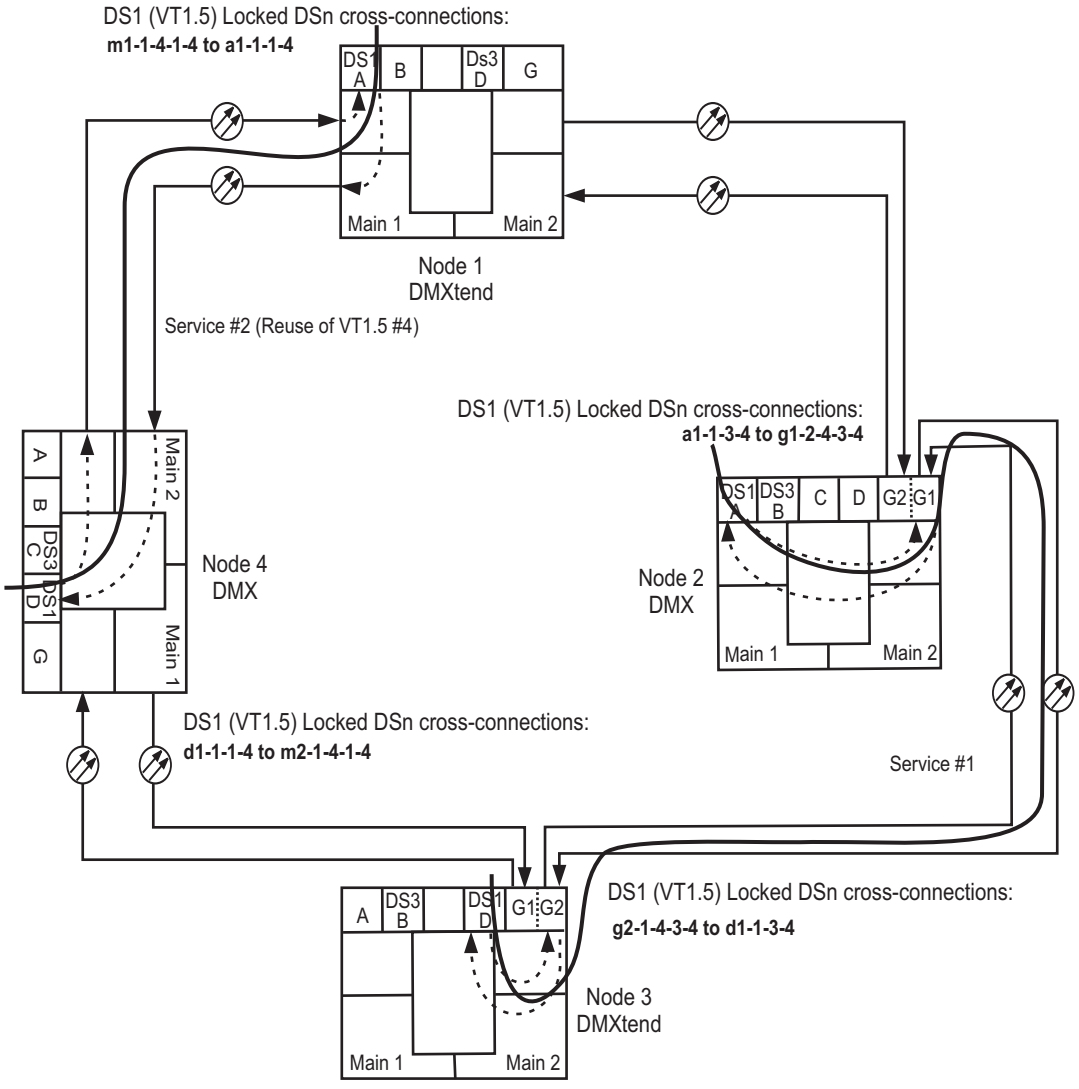
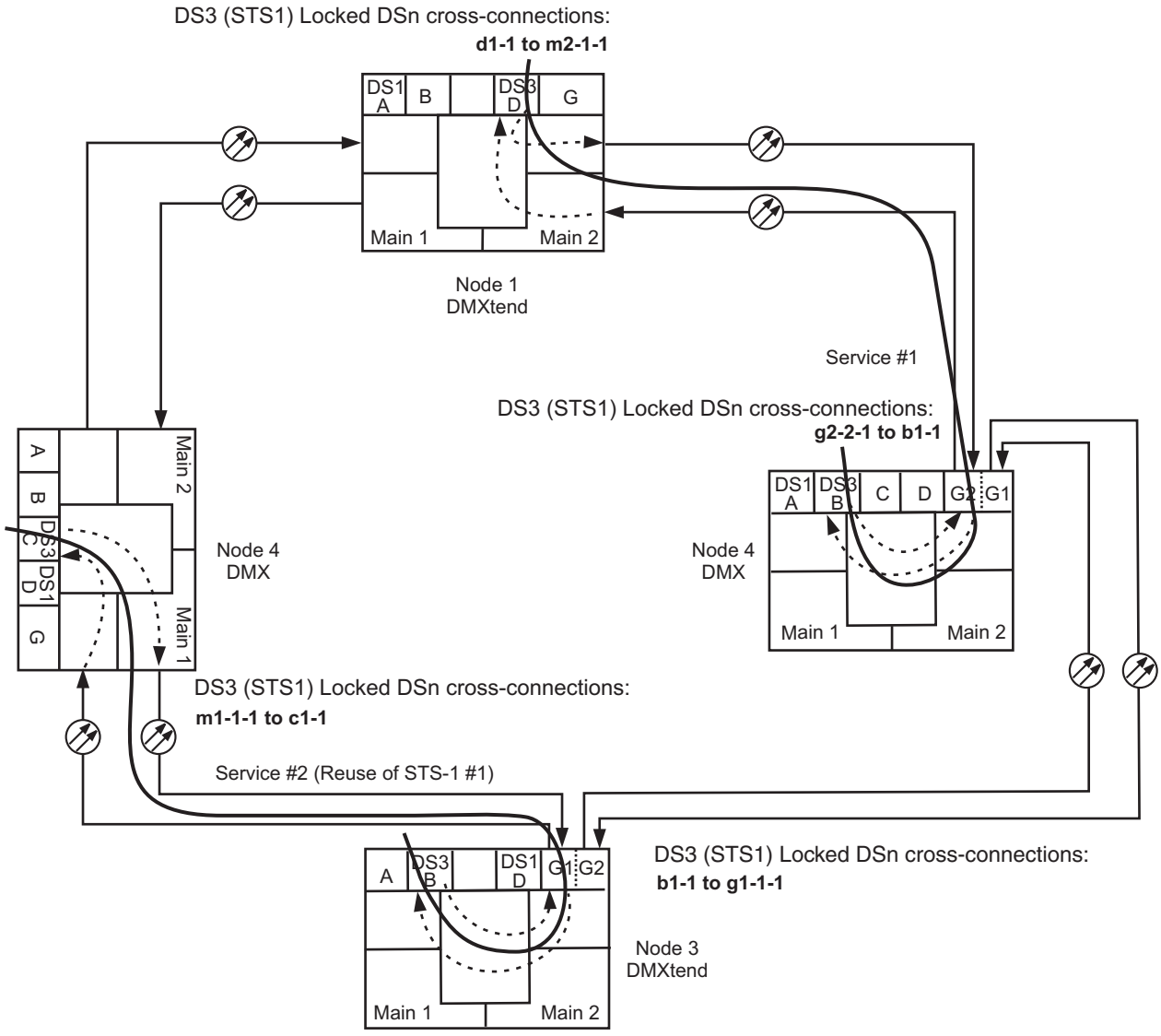


Figure 10-19 DS3 locked cross-connections on a UPSR (unprotected)

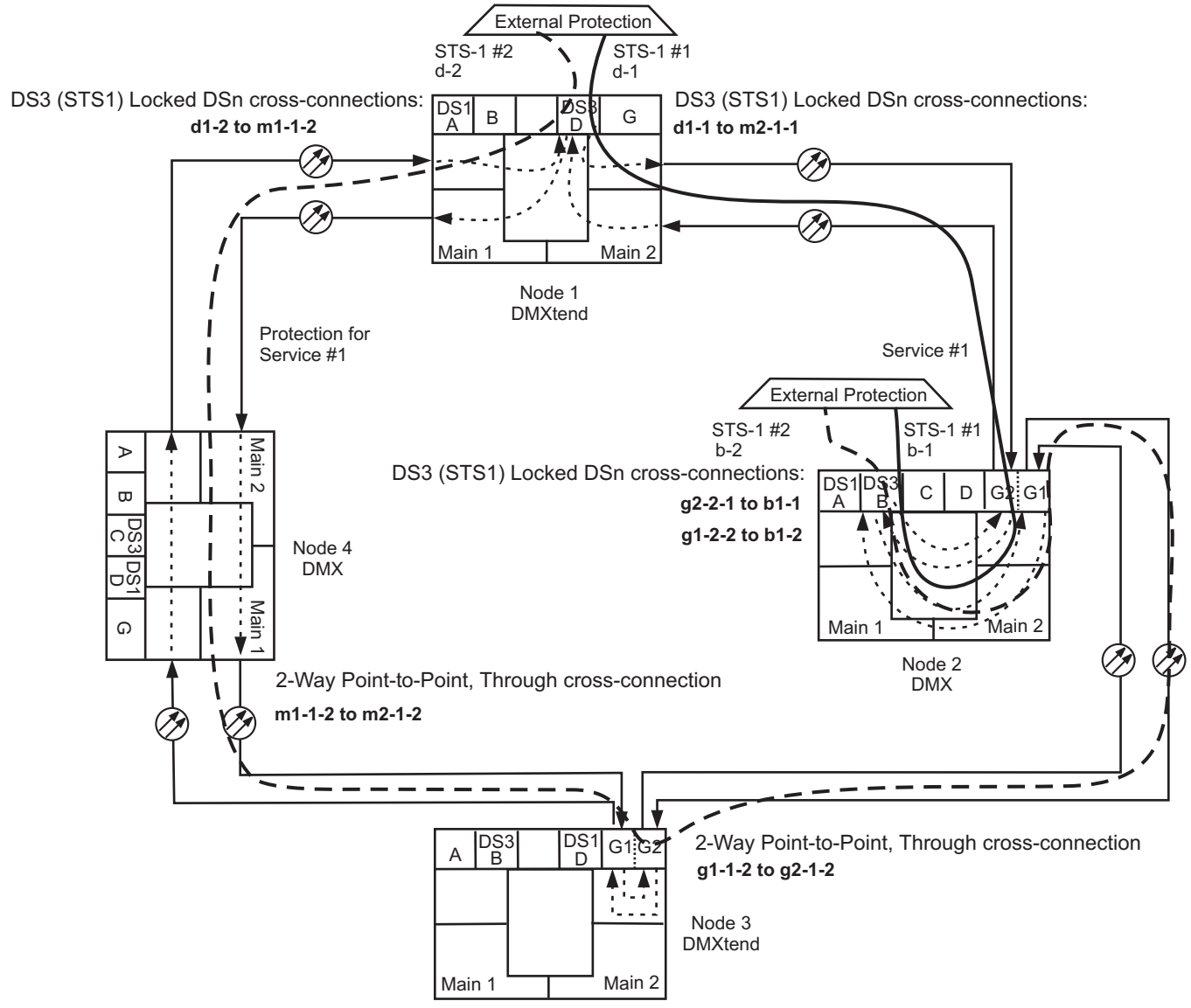


DMX = 1665 Data Multiplexer

DMXtend = 1665 Data Multiplexer Extend

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Figure 10-20 DS3 locked cross-connections on a UPSR (protected externally)



DMX = 1665 Data Multiplexer

DMXtend = 1665 Data Multiplexer Extend

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Procedure 10-13: Provision VT1.5 cross-connections on a BLSR

Overview

This procedure provides an example to provision VT1.5 cross-connections on a BLSR ring. This procedure uses the CIT *Cross-Connection Wizard* commands to illustrate the provisioning. The same provisioning may be made using the TL1 **`ent-crs-( )`** command. Refer to Figure 10-21, "BLSR VT cross-connection examples" (p. 10-77) for example cross-connections.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that you have the work instructions for this procedure stating the circuit pack and port options to be set, the pass-through and terminating end nodes, and cross-connections being made.
4. Verify the network has been established and that all necessary circuit packs and port options have been provisioned for the service being established.
5. Review the rules for provisioning in "VT cross-connections for BLSR" (p. 10-78).

Steps

Perform the following steps to make the necessary cross-connections.

1 Connect the PC and establish a *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select Active (NVM) in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* or *OSI Routing Map* window opens if the **Administration** → **OSI Neighbor Map** or **Administration** → **OSI Routing Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on the work order or circuit order.

Verify that the VT cross-connections specified in your work order are supported at the nodes in the path of the cross-connections.

Note the **Ring Node VT Type** for each of the nodes that are participating in the cross-connection. In VT-accessed BLSRs containing VT Type 1 nodes, VT circuits may be provisioned provided they do not pass through a Type 1 node.

Important! Because of the potential for improper squelching, provisioning VT circuits in rings with VT Type 1 nodes is *not* recommended. Also, VT automatic squelch map generation and VT ring circuit audits are not supported in rings containing VT Type 1 nodes other than Alcatel-Lucent 1665 DMX nodes.

4 From work order or circuit order, determine the terminating (drop) nodes and the pass-through nodes for the service being established.

Important! In ring configurations, you should use the following general rules in establishing cross-connections in each ring.

Cross-Connect Rules

1. All cross-connections to/from the same STS-1 timeslot must be provisioned the same, either all VT1.5 or STS-1.
2. If all 28 VT1.5s (DS1s) in an STS-1 are being passed through at a node in a VT1.5 ring, then the cross-connection may be provisioned as either a pass-through STS-1 or VT1.5. However, if you are dropping VT1.5s from the pass through node in the future or monitoring VT path faults, you should provision the pass-throughs as VT1.5 cross-connections.

5 Log in to each node in the network and verify that each shelf is properly equipped for the service being established. From the System View menu select **View** → **Equipment**.

6 From work order or circuit order, determine the cross-connections to be made at each node associated with the service to be established. See Figure 10-21, "BLSR VT cross-connection examples" (p. 10-77) for DS1 cross-connection examples.

Important! Cross-connections supporting DS1 services may be either STS-1 or VT1.5 cross-connections. Use VT1.5 cross-connections for DS1 services if you expect to cross connect only *some* of the VT1.5 signals in the STS-1 channel. If STS-1 cross-connections are made at a shelf, there is a fixed mapping of all 28 VT1.5 cross-connections to a specific shelf group.

7 Starting at one of the terminating nodes for the circuit being established, at each node in the ring select **View** → **Cross-Connections** from the System View menu to verify that the cross-connections specified on the work order or circuit order may be made. If the cross-connections are already assigned to another service or improperly assigned, refer trouble to the organization responsible for facility design. Improperly assigned cross-connections may have to be deleted.

8 At all non-terminating nodes in the circuit, provision pass-through cross-connections. From the System View menu select **Configuration** → **Cross-Connections**, then use the *Cross-Connection Wizard* to make the cross-connections at all nodes through which the circuit is routed. Select **2-Way Point-to-Point, Through** for pass through cross-connections.

9 At the terminating (add/drop) nodes of the circuit being established, establish the terminating cross-connections. From the System View menu select **Configuration** → **Cross-Connections**, then use the *Cross-Connection Wizard* to make the **2F BLSR Add/Drop** cross-connections.

10 Verify that the proper connection has been made. From the System View menu select **View** → **Cross-Connections**. If changes are required, return to the *Cross-Connection Wizard* to make them.

11 After all cross-connections have been made, verify that the channels have gone in service at *each* terminating node. From the System View menu at *each* terminating node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

Alarms are not reported until the channel state transitions to in-service (IS) which happens only when a good signal is received. Since there is a connection only to one side of the BLSR ring, no alarms are reported until all upstream connections are correct.

12 Expand the details for the circuit pack being used. Select the required port, then click **Select** at the bottom of the window. Verify the port AID is correct at the top of the parameter display.

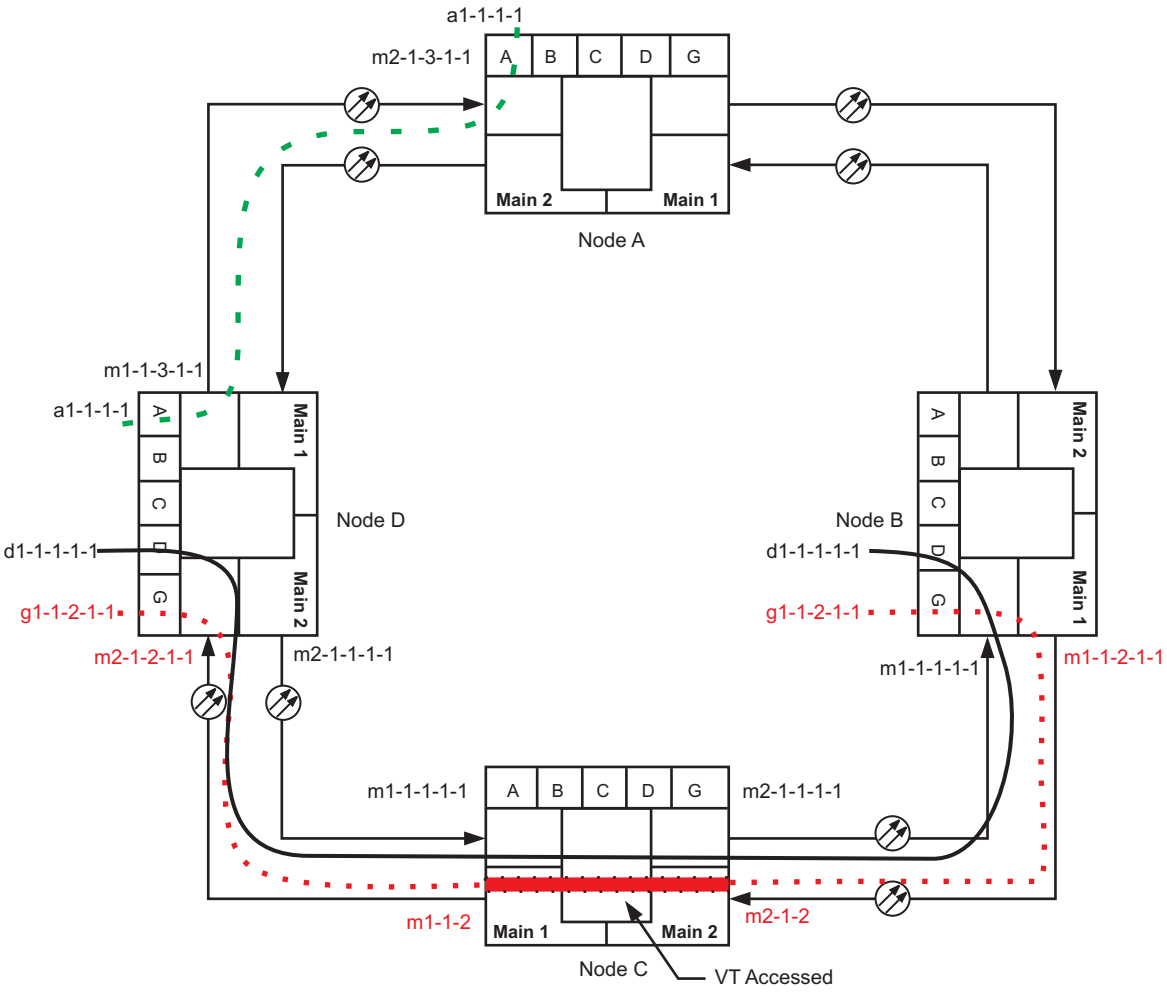
13 Under **Port Data/Fault** in the parameter display, verify the **Port Monitoring Mode** is *IS* (in service). If the **Port Monitoring Mode** is *IS*, then Stop, you have completed this procedure. Otherwise, perform one of the following:

- If the **Port Monitoring Mode** is *NMON* (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, select the required port and then click **Select** at the bottom of the window.
  2. Under the **Fault Management** section, select *AUTO* (Automatic) for the **Port Monitoring Mode**.
  3. Click **Apply** at the bottom of the window.
  4. Click **Close** to exit the window, then repeat this procedure from Step 11.
- If the **Port Monitoring Mode** is *AUTO*:
  Check the connections at the local cross-connect panel (or equivalent connection point).

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Figure 10-21 BLSR VT cross-connection examples



Node A:
2F BLSR Add/Drop VT1.5 cross-connections:
m2-1-3-1-1,a1-1-1-1; Source NE = Node D, VT Source NE = Node D

Node B:
2F BLSR Add/Drop VT1.5 cross-connections:
m1-1-1-1-1,d1-1-1-1-1; Source NE = NodeC, VT Source NE = NodeD
m1-1-2-1-1,g1-1-2-1-1; Source NE = NodeD, VT Source NE = NodeD

Node C:
2-Way Point-to-Point, Through cross-connections:
m1-1-1-1-1,m2-1-1-1-1; Source NE = NodeD, Destination NE = NodeB
m1-1-2,m2-1-2; Source NE = NodeD, Destination NE = NodeB, VT Accessed = YES

Node D:
2F BLSR Add/Drop VT1.5 cross-connections:
m1-1-3-1-1,a1-1-1-1; Source NE = Node A, VT Source NE = Node A
m2-1-1-1-1,d1-1-1-1-1; Source NE = NodeC, VT Source NE = NodeB
m2-1-2-1-1,g1-1-2-1-1; Source NE = NodeB, VT Source NE = NodeB

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VT cross-connections for BLSR

BLSR access

A VT-accessed BLSR must contain VT Type 3 nodes but may also include VT Type 2 and/or VT Type 1 nodes. For BLSRs containing VT Type 1 nodes, VT circuits can be provisioned if they do *not* pass through a Type 1 node. In rings operating with automatic ring discovery, the **Ring Node VT Type** parameter can be reported using the **View** → **Rings** → **Ring Map** command from the System View menu.

Reference the following for Ring Node VT Type descriptions:

- Type 1: The node does not support VT BLSR access. All Alcatel-Lucent products which support BLSRs but do not support VT access.
- Type 2: The node (Release 4.0 and later) supports VT-accessed STS-1 pass-through cross-connections only. VT cross-connection provisioning is *not* supported. Type 2 nodes are equipped with LNW26B 28, 31, 77, or 121B-159B OC-48 OLIU circuit packs.
- Type 3: The node (Release 4.0 and later) supports VT cross-connections *and* VT-accessed STS-1 pass-through cross-connections. Type 3 nodes are equipped with LNW27, 29, 32, 76, 202, or 221–259 OC-48 OLIU circuit packs or LNW56, 57, 58, 502, 523, 527, 554, or 555 OC-192 OLIU circuit packs.

VT cross-connection parameters

In addition to regular BLSR STS-1 cross-connection parameters, the following parameters are required for provisioning VT1.5 BLSR cross-connections:

- **VT Source NE Name** (**`vtloca`**): vtloca is the source node TID of a VT1.5 BLSR cross-connection.
- **VT Accessed** (**`vtacc`**): vtacc is an attribute of a STS-1 BLSR pass-through cross-connection. It specifies whether or not the VTs transported within the STS-1 are cross-connected at the VT1.5 rate at other nodes in the circuit.

Rules for VT Source/Destination NE Name parameters

The following rules apply for specifying parameters when manually provisioning the VT squelch map entries:

VT Cross-Connection Type	VT Source NE Name (vtloca)
1-way unswitched or 2-way unswitched	Must not be provisioned.
1-way pass-through or 2-way pass-through	Must not be provisioned.
2-way add/drop (including inter-ring and switched cross-connections)	Must be provisioned if the source aid is a VT in a BLSR protection group.

1-way (including inter-ring and switched cross-connections)	Must be provisioned if the source aid is a VT in a BLSR protection group.

Source/Destination NE Name (loca/locz) parameters

In addition to provisioning **vtloca** parameters when provisioning VT cross-connections, it is also necessary to provision the **Source NE Name** (**loca**) and/or **Destination NE Name** (**locz**) parameters for the STS-1 that is carrying the VT connections. For each direction of transmission, the source/destination node of a VT-accessed STS-1 is the nearest node in the ring at which VT cross-connections are provisioned to that STS-1. When provisioning multiple VT cross-connections on a single STS-1, the STS-1 **loca**/**locz** parameter for all the VT cross-connections must be the same.

If, at a given ring node in a VT circuit, the STS-1 carrying the VT traffic will not be VT accessed at that node, the user may provision a single STS-1 pass-through cross-connection rather than multiple VT pass-through cross-connections. This single cross-connection will not use VT fabric capacity. For this STS-1 cross-connection it is necessary to provision both the **loca** and **locz** parameters. For each direction of transmission, the source/destination node of this STS-1 is the nearest node in the ring at which VT cross-connections are provisioned to that STS-1.

VT Accessed STS-1 pass-through cross-connections

In addition to provisioning the **loca** and **locz** parameters for VT-accessed *STS-1* pass-through cross-connections, it is also necessary to mark these cross-connections as **VT Accessed**(**vtacc**) in order to properly unsquelch these STS-1s at switching nodes if the source or destination node is isolated. Likewise, if an STS-1 pass-through is *not* supporting VT circuits, it must not be marked as VT Accessed.

Procedure 10-14: Configure LNW20 TMUX/DS3/EC1 applications

Overview

This procedure provides examples for TMUX/DS3/EC1 applications and cross-connections.

The examples show port provisioning and cross-connections to various interfaces to illustrate applications for TMUX configurations. This procedure uses TL1 commands to illustrate the provisioning. The same provisioning may be made using the *WaveStar*® CIT *Cross-Connection Wizard*.

One-way TL1 command cross-connections are used in the examples due to the complexity of the signal paths involved.

Important! For detailed information about cross-connections and restrictions regarding circuit pack types, rates, and VT granularity, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that you have the work instructions for this procedure stating the circuit pack and port options to be set and the cross-connections being made.

Steps

Complete the following steps to provision the TMUX applications.

1 Click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 From the System View menu at each terminating node, select **View** → **Equipment** to verify that the proper service and protection circuit packs have been installed and provisioned in the Function Unit/Growth groups used for this service.

3 If circuit packs have not been installed or provisioned, install and provision circuit packs as required.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

4 If circuit pack ports have not been provisioned, provision circuit pack ports as required.

Reference: Chapter 4, "Install and provision circuit packs/OLIUs procedures"

5 Verify that the cable connections have been made from the terminating nodes to the cross-connect panel or equivalent connection points.

6 Determine the necessary cross-connections for each node from the work instructions.

7 **Important!** For detailed information about cross-connections and restrictions regarding circuit pack types, rates, and VT granularity, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*.

Use the TL1 **`ent-crs-( )`** command or select **Configuration** → **Cross-Connections** from the System View menu to access the *Cross-Connection Wizard* and create the required new cross-connections. Follow the *Cross-Connection Wizard* instructions to select the Rate, Type of Cross-Connection, Source/Destination, Circuit Identifier, and Source NE Name.

8 **Important!** If the **Port Monitoring Mode** of a ported EC-1/DS3/constituent DS1 port is provisioned to *NMON*, the port is not monitored/alarmed and the port will not automatically transition to the *IS* (in-service) state when a good EC-1/DS3 signal (not EC-1/DS3 LOS, EC-1/DS3LOF, DS3 AIS) is detected.

If the **Port Monitoring Mode** is provisioned to *AUTO*, the port automatically transitions to the *IS* (in-service) state when a good EC-1/DS3 signal (not EC-1/DS3 LOS, EC-1/DS3 LOF, DS3 AIS) is detected, and the port is monitored/alarmed. If a DS3 port transitions to *IS*, the constituent DS1 ports transition to *IS*.

If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

User provisioning of a DS3 port is automatically applied to any constituent DS1 ports.

Select **View** → **Equipment** to access the required ported EC-1/DS3/constituent DS1 ports and verify the value of the **Port Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access ports and change the value of the **Port Monitoring Mode** parameter.

The following methods may be used to change default monitoring and alarm reporting for ported EC-1/DS3/constituent DS1 ports.

- When the DS3 **Port Monitoring Mode** parameter is provisioned to NMON the DS3 port and any constituent DS1 ports are not monitored/alarmed.
- When any unused constituent DS1 **Port Monitoring Mode** parameter is provisioned to NMON only the affected constituent DS1 port is not monitored/alarmed. The DS3 port and the remaining constituent DS1 ports are unaffected.
- Create a new alarm severity assignment profile for unused DS1 ports. Any undesired DS1 alarms can be provisioned Not Reported (NR). Refer to Procedure 6-7: “Provision new alarm severity assignment profile” (p. 6-32).

9 **Important!** If the **Port Monitoring Mode** of a portless DS1 port is provisioned to *NMON*, the DS1 port is not monitored/alarmed and the port will not automatically transition to the *IS* (in-service) state when a good STS-1 tributary signal (not STS-1 AIS-P, LOP-P, UNEQ-P, SF) is detected.

If the **Port Monitoring Mode** is provisioned to *AUTO*, the DS1 port automatically transitions to the *IS* (in-service) state when a good STS-1 tributary signal (not STS-1 AIS-P, LOP-P, UNEQ-P, SF) is detected, and the port is monitored/alarmed. If the STS-1 tributary transitions to *IS*, the constituent DS1 ports transition to *IS*.

If the **Port Monitoring Mode** is provisioned to *IS*, the port is monitored and alarms are reported.

User provisioning of the STS-1 tributary is automatically applied to the constituent DS1 ports. The constituent DS1 port states are controlled by the state of the Source STS-1 Tributary of the cross-connection from the OLIU/EC-1 to the DS3.

Select **View** → **Equipment** to access the required source STS-1 tributary and portless DS1 ports and verify the value of the STS-1 **Tributary Monitoring Mode** and DS1 **Port Monitoring Mode** parameters.

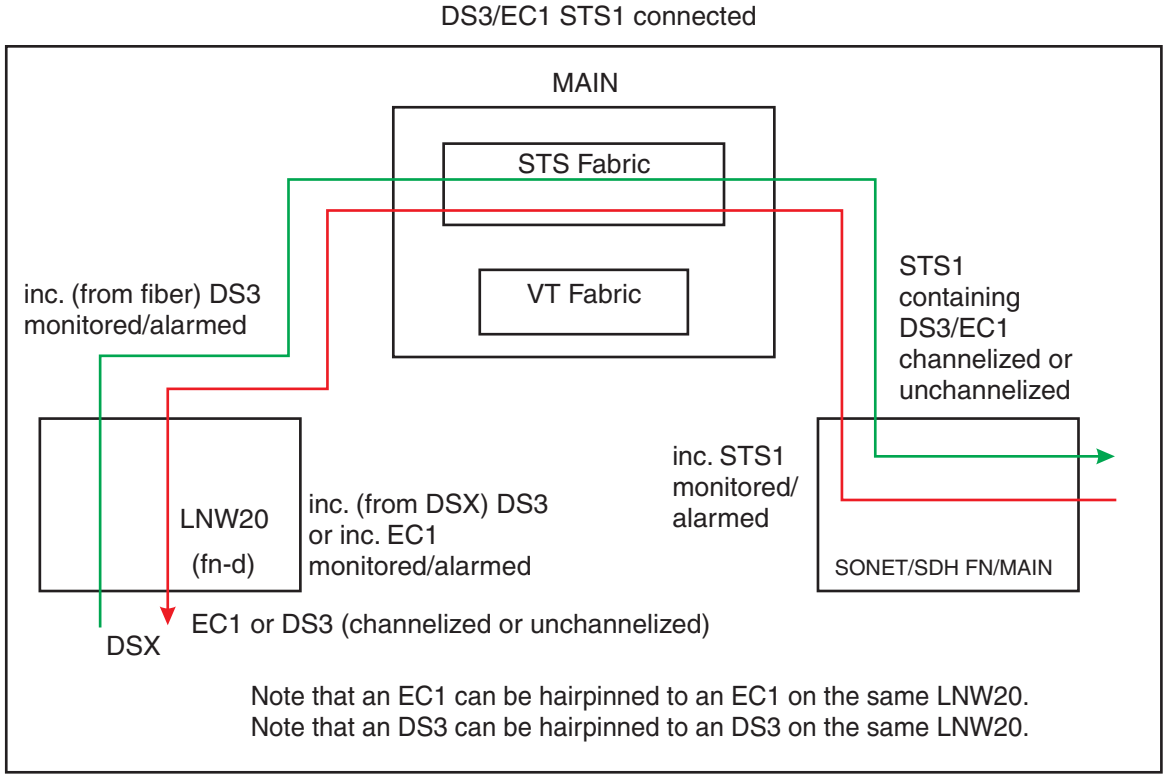
If required, select **Configuration** → **Equipment** to access the source STS-1 tributary and portless DS1 ports and change the value of the STS-1 **Tributary Monitoring Mode** and DS1 **Port Monitoring Mode** parameters.

The following methods may be used to change default monitoring and alarm reporting for source STS-1 tributaries and portless DS1 ports.

- When the source STS-1 **Tributary Monitoring Mode** parameter is provisioned to NMON the portless DS1 ports are not monitored/alarmed.
- When any unused portless DS1 **Port Monitoring Mode** parameter is provisioned to NMON only the affected portless DS1 port is not monitored/alarmed. The source STS-1 tributary and the remaining portless DS1 ports are unaffected.
- Create a new alarm severity assignment profile for unused portless DS1 ports. Any undesired DS1 alarms can be Not Reported (NR). Refer to Procedure 6-7: “Provision new alarm severity assignment profile” (p. 6-32).

10 Use the following examples for reference in configuring the TMUX applications.

Figure 10-22 Example of basic DS3/EC1 STS-1 Add/Drop (like LNW16/LNW19/19B) Configuration



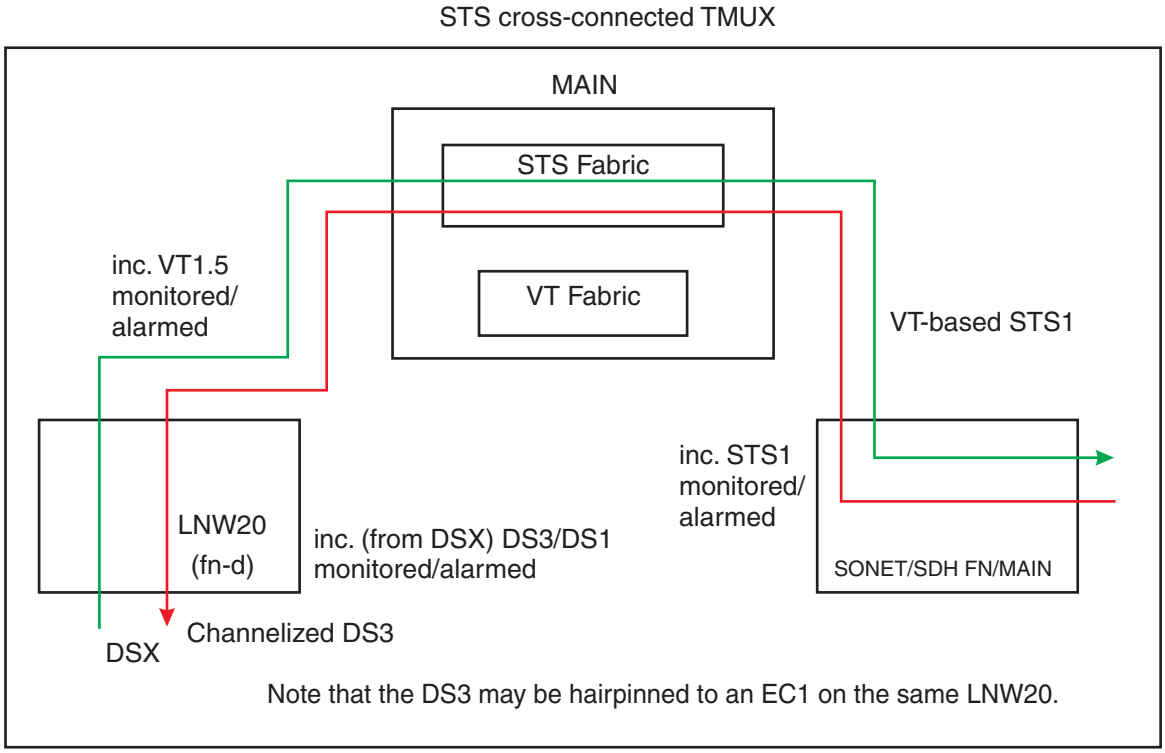
Example:
Electrical Interface Type: EC1
or
Electrical Interface Type: DS3
Port Mode: PORTED
Trib Mode: UNCHAN

TL1:
ent-crs-sts1:m1-1-1,d1-1;
ent-crs-sts1:d1-1,m1-1-1;

CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1
B (Destination): d1-1
Circuit Identifier: Example 1

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Figure 10-23 Example of basic TMUX Channelized DS3 STS1-xconn to VT-based STS1 (like LNW18)



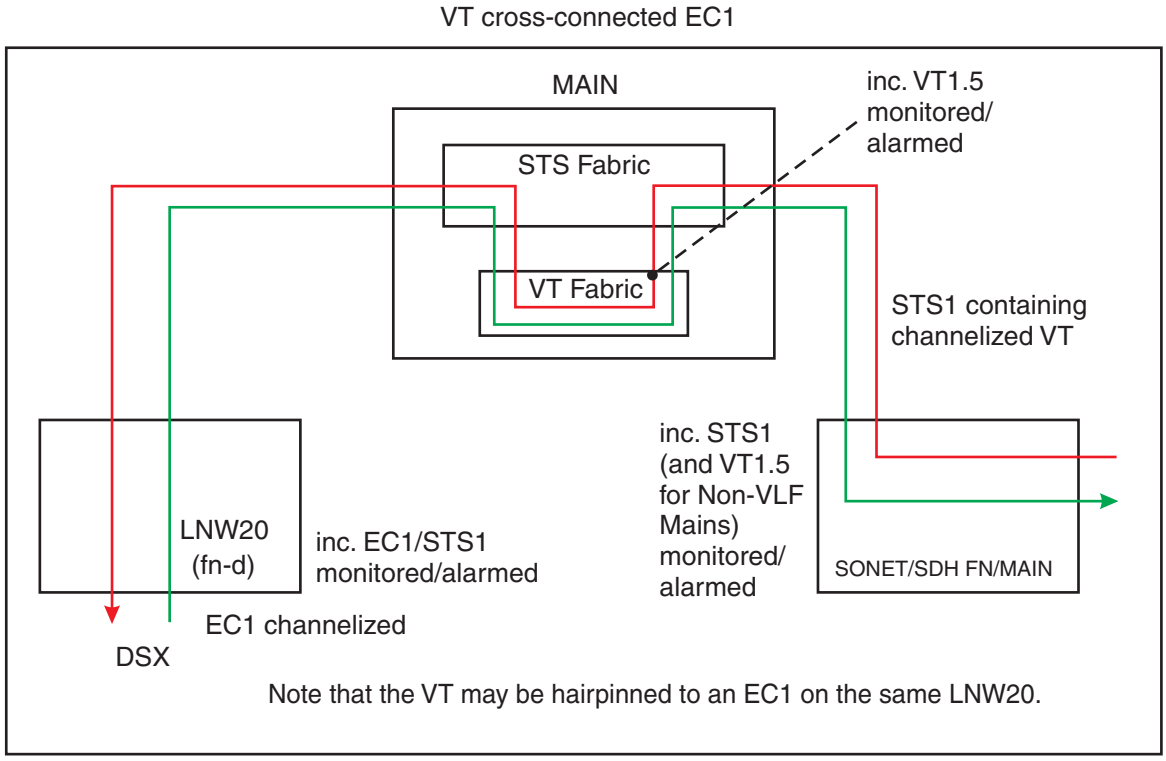
Example:
Electrical Interface Type: DS3
Port Mode: PORTED
Trib Mode: CHAN

TL1:
ent-crs-sts1:m1-1-1,d1-1;
ent-crs-sts1:d1-1,m1-1-1;

CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1
B (Destination): d1-1
Circuit Identifier: Example 2

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Figure 10-24 Example of basic EC1 VT Add/Drop (like LNW16/LNW19/19B) Configuration



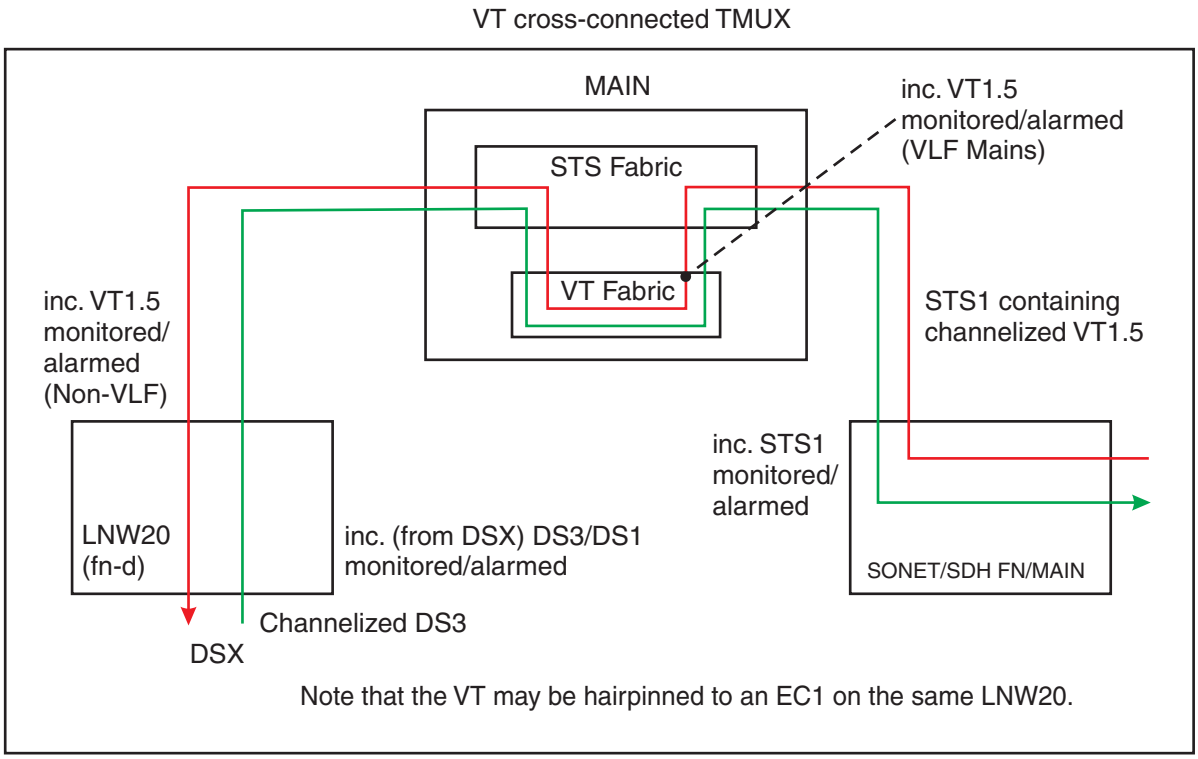
Example:
Electrical Interface Type: EC1
Port Mode: PORTED

TL1:
ent-crs-vt1:m1-1-1-1-1,d1-1-1-1;
ent-crs-vt1:d1-1-1-1,m1-1-1-1-1;

CIT Cross-Connection Wizard:
Rate: VT1.5
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1-1-1
B (Destination): d1-1-1-1
Circuit Identifier: Example 3

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Figure 10-25 Example of basic TMUX (like LNW18) Configuration



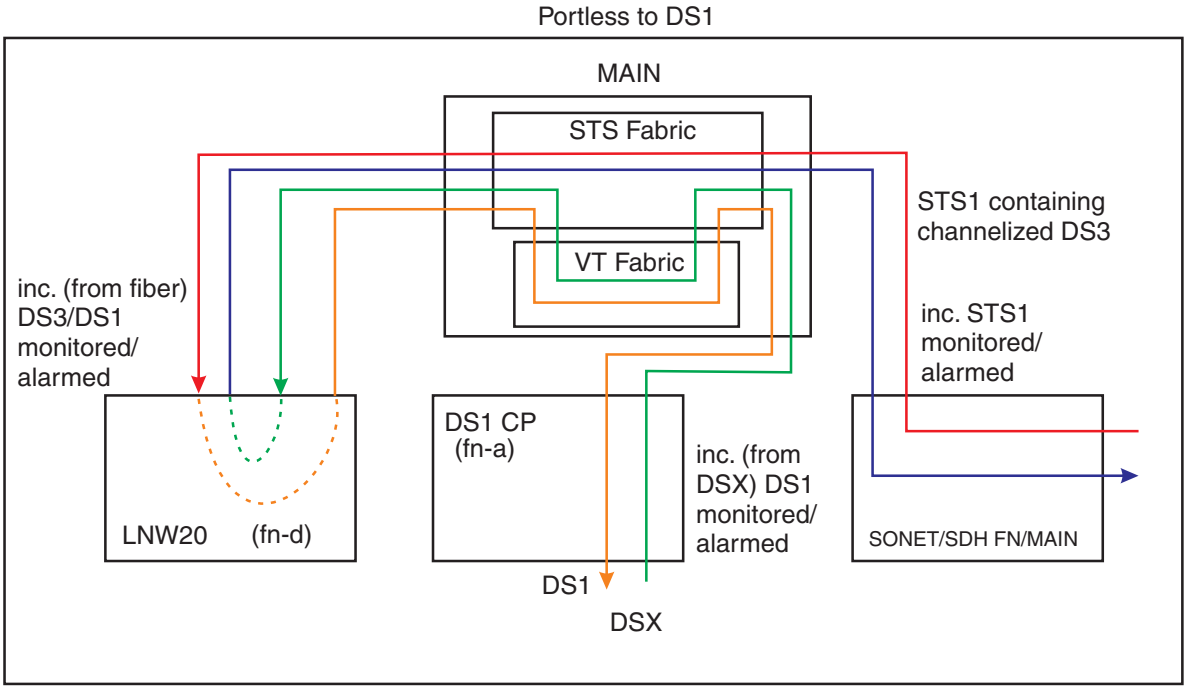
Example:
Electrical Interface Type: DS3
Port Mode: PORTED
Trib Mode: CHAN

TL1:
ent-crs-vt1:m1-1-1-1-1,d1-1-1-1;
ent-crs-vt1:d1-1-1-1,m1-1-1-1-1;

CIT Cross-Connection Wizard:
Rate: VT1.5
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1-1-1
B (Destination): d1-1-1-1
Circuit Identifier: Example 4

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Figure 10-26 Example of DS1-in-DS3-in-STS1 Portless TMUX to DS1 Port



Example:
Electrical Interface Type: DS3
Port Mode: PORTLESS

TL1:
ent-crs-sts1:m1-1-1,d1-1;
ent-crs-sts1:d1-1,m1-1-1;

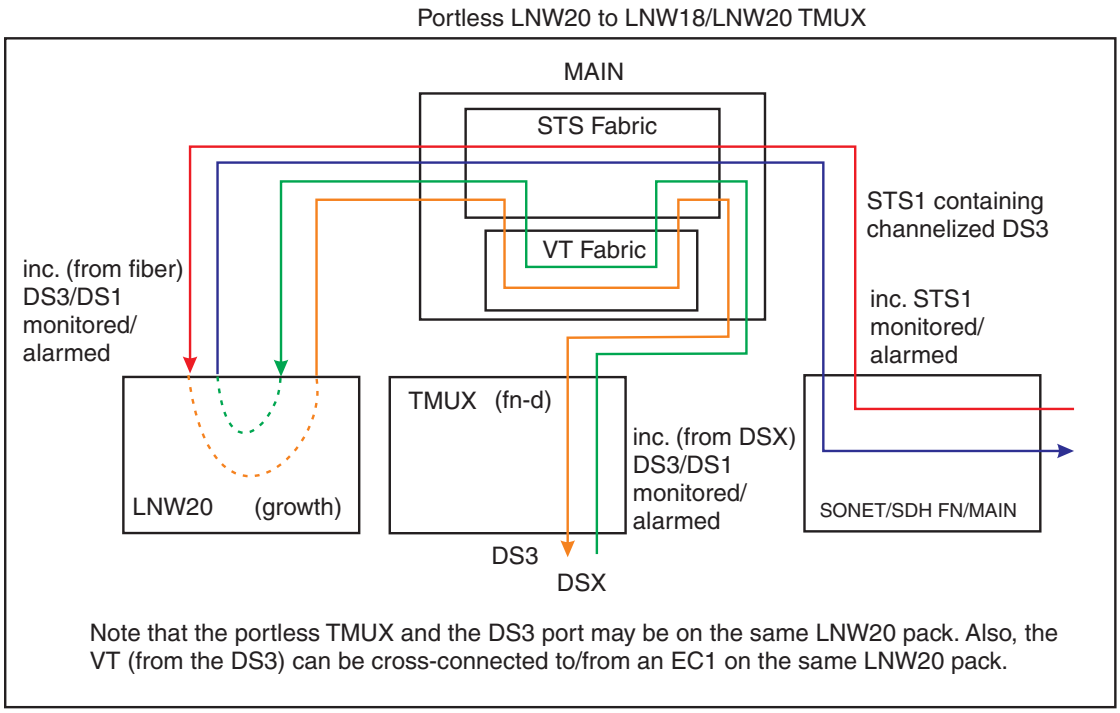
CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1
B (Destination): d1-1
Circuit Identifier: Example 5

TL1:
ent-crs-vt1:d1-1-1-1,a1-1-1-1;
ent-crs-vt1:a1-1-1-1,d1-1-1-1;

CIT Cross-Connection Wizard:
Rate: VT1.5
Type of Cross-connection: 2-Way Hairpin
A (Source): d1-1-1-1
B (Destination): a1-1-1-1
Circuit Identifier: Example 6

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Figure 10-27 Example of DS1-in-DS3-in-STS1 Portless TMUX to DS1-in-DS3 Port



Example:
Electrical Interface Type: DS3
Port Mode: PORTLESS

TL1:
ent-crs-sts1:m1-1-1,g1-1;
ent-crs-sts1:g1-1,m1-1-1;

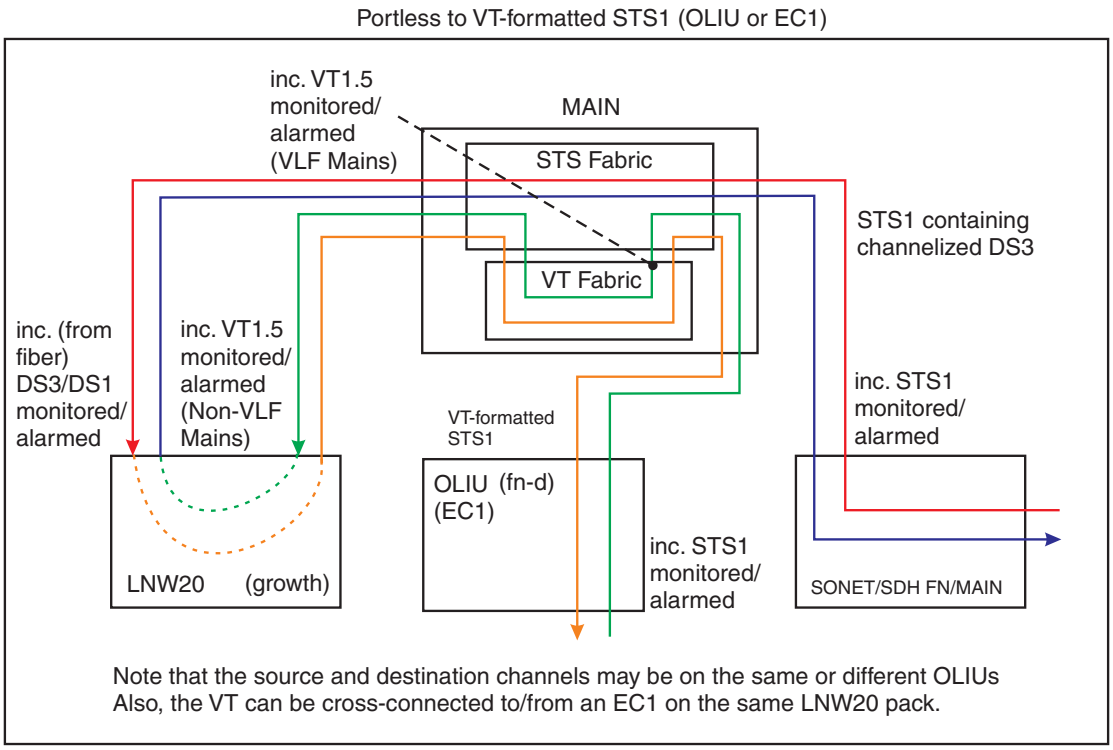
CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1
B (Destination): g1-1
Circuit Identifier: Example 7

TL1:
ent-crs-vt1:g1-1-1-1,d1-1-1-1;
ent-crs-vt1:d1-1-1-1,g1-1-1-1;

CIT Cross-Connection Wizard:
Rate: VT1.5
Type of Cross-connection: 2-Way Hairpin
A (Source): g1-1-1-1
B (Destination): d1-1-1-1
Circuit Identifier: Example 8

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Figure 10-28 Example of DS1-in-DS3-in-STS1 Portless TMUX to VT-in-STS1



Example:
Electrical Interface Type: DS3
Port Mode: PORTLESS

TL1:
ent-crs-sts1:m1-1-1,g1-1;
ent-crs-sts1:g1-1,m1-1-1;

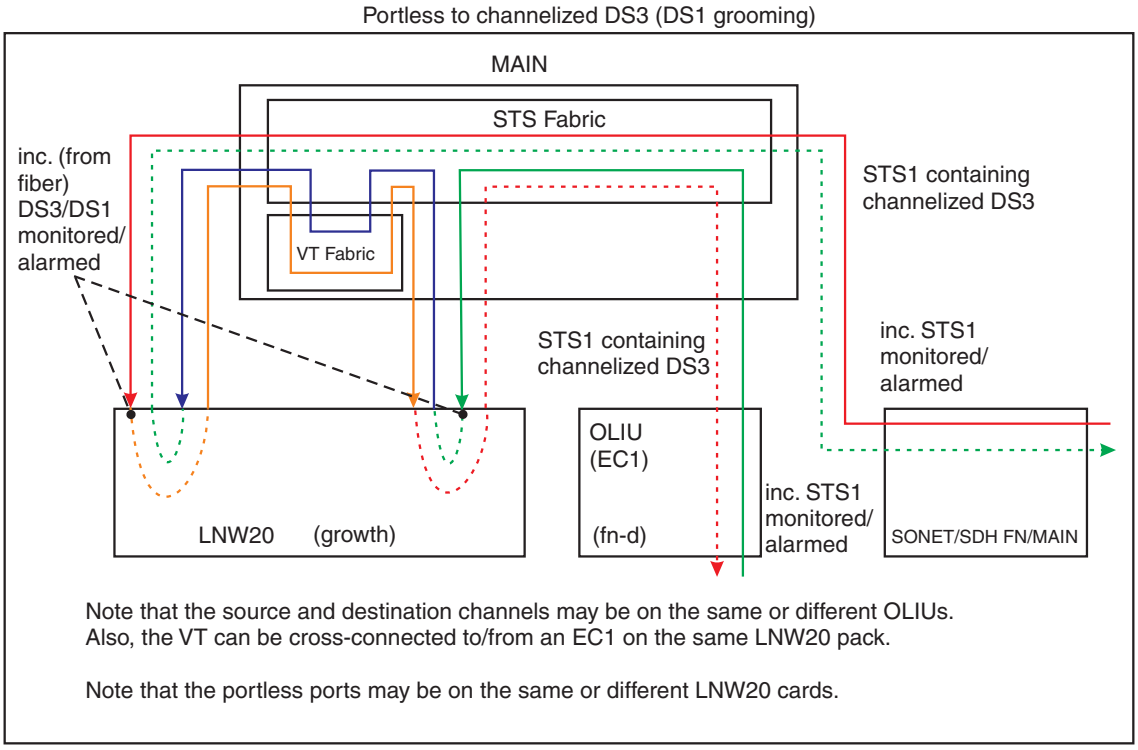
CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1
B (Destination): g1-1
Circuit Identifier: Example 9

TL1:
ent-crs-vt1:g1-1-1-1,d1-1-1-1;
ent-crs-vt1:d1-1-1-1-1,g1-1-1-1;

CIT Cross-Connection Wizard:
Rate: VT1.5
Type of Cross-connection: 2-Way Hairpin
A (Source): g1-1-1-1
B (Destination): d1-1-1-1
Circuit Identifier: Example 10

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Figure 10-29 Example of DS1-in-DS3-in-STS1 Portless TMUX to DS1-in-DS3-in-STS1 (DS1 grooming)



Example:
Electrical Interface Type: DS3
Port Mode: PORTLESS

TL1:
ent-crs-sts1:m1-1-1,g1-1;
ent-crs-sts1:g1-1,m1-1-1;(dash line);

CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 0x1 Add/Drop
A (Source): m1-1-1
B (Destination): g1-1
Circuit Identifier: Example 11

TL1:
ent-crs-vt1:g1-1-1-1,g1-3-1-1;
ent-crs-vt1:g1-3-1-1,g1-1-1-1;

CIT Cross-Connection Wizard:
Rate: VT1.5
Type of Cross-connection: 2-Way Hairpin
A (Source): g1-1-1-1
B (Destination): g1-3-1-1
Circuit Identifier: Example 12

TL1:
ent-crs-sts1:g1-3,d1-1-1;(dash line)
ent-crs-sts1:d1-1-1,g1-3;

CIT Cross-Connection Wizard:
Rate: STS1
Type of Cross-connection: 2-Way Hairpin
A (Source): g1-3
B (Destination): d1-1-1
Circuit Identifier: Example 13

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END OF STEPS

Procedure 10-15: Add optical channel (OCH) to DWDM network

Overview

Use this procedure to add an optical channel (OCH) to a DWDM network.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelf and network have been properly equipped and tested. If the Alcatel-Lucent 1665 DMX shelf has not been properly equipped, refer to Chapter 5, "Node turnup procedures". If the DWDM network has not been properly configured, refer to Procedure 9-12: "Establish DWDM network" (p. 9-142).

Supported optical channels/wavelengths

Alcatel-Lucent 1665 DMX supports DWDM wavelengths based on the industry standard ITU-T grid at 100-GHz spacing in the C band. The following optical channels and wavelengths are supported.

- 9520 (195.20 THz)
- 9530 (195.30 THz)
- 9540 (195.40 THz)
- 9550 (195.50 THz)
- 9560 (195.60 THz)
- 9570 (195.70 THz)
- 9580 (195.80 THz)
- 9590 (195.90 THz)

DWDM-compatible circuit packs

The following circuit packs are DWDM compatible:

- LNW57 OC-192 OLIU (channel 9550)
- LNW59 OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW60 OC-192 OLIU (channel 9550)
- LNW502 OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW504 OC-48/OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW554 tunable OC-192 OLIU (channels 9520, 9530, 9540, 9550)
- LNW555 OC-192 OLIU (channel 9550)

- LNW603 OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW705 XM10G/8 Muxponder with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)

Compatible DWDM optical signals that are terminated by other network elements are also supported (alien wavelengths).

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, pass-through nodes (if required), add/drop optical port addresses, Optical Channel (OCH) port addresses, the OCH port parameters to provision, and the OCH cross-connections to be established.

Steps

Complete the following steps to add an optical channel (OCH) to a DWDM network.

1 Using the work instructions, determine the DWDM network configuration and identify the terminating nodes and pass-through nodes (if required) for the optical channel being added.

Important! It may be helpful to make a sketch of the DWDM network to visualize the path of the optical channel through the network.

2 At the terminating and pass-through nodes (if required), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 **Important!** The Expected Frequency of the DWDM-compatible optics on a PTM-based OLIU, non-PTM-based OLIU, or the OTU2 port of an XM10G/8 circuit pack must match the OCH port frequency. If the Expected Frequency of the of the DWDM-compatible optics and the OCH port frequency are different, attempts to provision an OCH cross-connection will be denied.

The frequencies are not compared if the DWDM compatible signal is terminated by a different network element (alien wavelength).

If terminating nodes are equipped with...	Then...
add/drop OLIUs with DWDM-compatible pluggable transmission modules,	At the terminating nodes, select **View** → **Equipment** to access the required add/drop DWDM pluggable transmission module and verify that the provisioned Expected Frequency matches the OCH port frequency. If the frequencies do not match, verify the work instructions and resolve mismatch according to local procedures. If required, select **Configuration** → **Equipment** to access the required add/drop DWDM pluggable transmission module and perform additional provisioning.
non-PTM based, DWDM-compatible add/drop OLIUs,	At the terminating nodes, select **View** → **Equipment** to access the required add/drop optical port and verify that the Expected Frequency matches the OCH port frequency. If the frequencies do not match, verify the work instructions and resolve mismatch according to local procedures.

If terminating nodes are equipped with...	Then...
tunable add/drop OLIUs,	At the terminating nodes, select **View** → **Equipment** to access the required tunable add/drop optical port and verify that the provisioned Selected Wavelength (frequency) matches the OCH port frequency. If the frequencies do not match, verify the work instructions and resolve mismatch according to local procedures. If required, select **Configuration** → **Equipment** to access the required tunable add/drop optical port and perform additional provisioning.

Reference:

- Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)
- Procedure 4-19: “Provision pluggable transmission module” (p. 4-109)

4 **Important!** OCH cross-connections are established between a DWDM-compatible OC-192 OLIU add/drop optical port and an OCH port with the same frequency or between the XM10G/8 OTU2 port and an OCH port with the same frequency. The OCH cross-connections are used to inform the network element about manual fiber connections. This allows the network element to enable alarm reporting and variable optical attenuators. The variable optical attenuators are enabled only when an OCH port is the destination of an OCH cross-connection. When an OCH port is the destination of an OCH cross-connection the OCH port state also transitions from no state to the AUTO state.

At the terminating and pass-through nodes (if required), select **Configuration** → **OCH Cross-Connections** to access the *OCH Cross-Connection Wizard* and provision the required OCH cross-connections.

Result: If the OCH port is the destination of an OCH cross-connection, then the variable optical attenuator and alarm reporting are enabled for the OCH port. The OCH port also transitions from no state to AUTO.

5 At the terminating and pass-through nodes (if required), select **View** → **Equipment** to access the required OCH ports and verify that the OCH port parameters are provisioned correctly.

If required, select **Configuration** → **Equipment** to access the required OCH ports and perform additional provisioning.

Reference: Procedure 4-27: "Provision optical channel (OCH) port" (p. 4-136)

6 **Important!** Attenuation is not required at the OMD circuit pack OCH port IN connectors. The circuit pack is equipped with variable optical attenuators and automatic optical power balancing to control the optical power of individual optical channels.

At both terminating nodes, perform the following to connect the optical fibers between the OCH port and the DWDM-compatible OC-192 OLIU add/drop optical port or XM10G/8 OTU2 port.

- Clean and connect the optical fibers to the required OUT connectors on the OMD circuit pack and the add/drop optical/OTU2 port.
- Measure the optical receive power of the optical fiber at the add/drop optical/OTU2 port using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for the SONET optical specifications of the OLIU circuit packs and pluggable transmission modules.)
- Clean and connect the optical fibers to the required IN connectors on the OMD circuit pack and the add/drop optical/OTU2 port.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

7 At the terminating and pass-through nodes (if required), perform end-to-end OCH line test.

Reference: Procedure 14-37: "Perform end-to-end optical line test on DWDM line" (p. 14-169)

8 **Important!** If the **Port Monitoring Mode** is provisioned to *NMON*, the OCH port is not monitored/alarmed and the OCH port will not automatically transition to the *IS* (in-service) state when a good signal (not LOS) is detected. If the **Port Monitoring Mode** is provisioned to *AUTO*, the OCH port automatically transitions to the *IS* (in-service) state when a good signal (not LOS) is detected, and the OCH port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the OCH port is monitored and alarms are reported.

At the terminating and pass-through nodes (if required), select **View** → **Equipment** to access the required OCH ports and verify the value of the **Port Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access OCH ports and change the value of the **Port Monitoring Mode** parameter.

Reference: Procedure 4-27: “Provision optical channel (OCH) port” (p. 4-136)

END OF STEPS

Procedure 10-16: Delete optical channel (OCH) from DWDM network

Overview

Use this procedure to delete an optical channel (OCH) from a DWDM network.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX is in service and that an optical channel is being deleted.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, pass-through nodes (if required), add/drop optical port addresses, Optical Channel (OCH) port addresses, and the OCH cross-connections to be deleted.

Steps

Complete the following steps to delete an optical channel (OCH) from a DWDM network.

1 Using the work instructions, determine the DWDM network configuration and identify the terminating nodes and pass-through nodes (if required) for the optical channel to be deleted.

Important! It may be helpful to make a sketch of the DWDM network to visualize the path of the optical channel through the network.

2 At the terminating and pass-through nodes (if required), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 **Important!** OCH cross-connections are used between a DWDM-compatible OC-192 OLIU add/drop optical port and an OCH port with the same frequency or between the XM10G/8 OTU2 port and an OCH port with the same frequency.

At the terminating and pass-through nodes (if required), determine the OCH cross-connections for the optical channel being deleted using the work instructions, *or* select **View** → **OCH Cross-Connections** to obtain a current list of OCH cross-connections.

Record the source addresses of the OCH cross-connections to be deleted.

4 At the terminating and pass-through nodes (if required), select **Configuration** → **OCH Cross-Connections** to access the *OCH Cross-Connection Wizard* and delete the OCH cross-connections for the optical channel being deleted.

5 **Important!** This step may activate the office alarms. The audible alarm may be suppressed by pressing the **ACO** push button.

At the terminating nodes, disconnect the optical fibers between the required OCH port and the add/drop optical port.

Result: The circuit pack **FAULT** LED and port LED (if equipped) flashes when the incoming signal is removed.

6 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the correct optical fibers were removed.

7 At the terminating nodes, select **Configuration** → **Update System** → **Update States** to clear the LOS alarms.

Result: The flashing circuit pack **FAULT** LED and port LED (if equipped) go off.

8 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the LOS alarms are cleared.

9 At the terminating nodes, select **View** → **Equipment** to access the required OCH ports and verify that the **Port Monitoring Mode** changed to *AUTO*.

10 At the terminating nodes (if required), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present.

END OF STEPS

Procedure 10-17: Add SONET/GbE/Data client signal

Overview

Use this procedure to add a SONET/GbE/Data client signal to a DWDM network.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX shelf and network have been properly equipped and tested. If the Alcatel-Lucent 1665 DMX shelf has not been properly equipped, refer to Chapter 5, "Node turnup procedures". If the DWDM network has not been properly configured, refer to Procedure 9-12: "Establish DWDM network" (p. 9-142) and/or Procedure 9-14: "Establish DWDM OTU2 line" (p. 9-177).

Supported client port configurations

The XM10G/8 circuit pack supports a mix of 1GE, FC100, FICON, FC200, FICON_EXP, and/or SONET OC3/12/48 client signals. The client signals are mapped into a single STS-192 and transmitted as an OTN OTU-2 signal.

Mixing client signals is supported with the following restrictions.

- OC-48, FC200, FICON_EXP signals are only supported on client ports 1, 3, 5, and 7.
- When the Signal Type parameter is provisioned to OC-48, FC200, FICON_EXP for client port 1, 3, 5, or 7, then the next adjacent client port is unavailable for use. For example, if the Signal Type parameter for client port 1 is provisioned to OC-48, then client port 2 is unavailable for use (STNA - Signal Type Not Available).

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, SONET/GbE/Data signal add/drop optical port addresses, client signal port addresses, required pluggable transmission modules, and the client signal port parameters to provision.

Steps

Complete the following steps to add a SONET/GbE/Data client signal to a DWDM network.

1 Using the work instructions, determine the DWDM network configuration and identify the terminating nodes for the client signal being added.

Important! It may be helpful to make a sketch of the DWDM network to visualize the path of the client signal through the network.

2 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 At the terminating nodes, select **View** → **Equipment** to access the required XM10G/8 circuit pack and verify that the client port Signal Type parameter is provisioned correctly.

If required, select **Configuration** → **Equipment** to access the required client port and provision the Signal Type parameter according to the work instructions.

Reference: Procedure 4-30: “Provision 10G Muxponder circuit pack SONET/GbE/Data client port” (p. 4-144)

4 At the terminating nodes, verify/install the required pluggable transmission modules being used for access according to the work instructions.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

5 At the terminating nodes, select **View** → **Equipment** to access the required XM10G/8 circuit pack and verify that the circuit pack/pluggable transmission module/client port parameters are provisioned correctly.

If required, select **Configuration** → **Equipment** to access the required circuit pack/pluggable transmission module/client port and perform additional provisioning.

Reference: Procedure 4-30: "Provision 10G Muxponder circuit pack SONET/GbE/Data client port" (p. 4-144)

6 At both terminating nodes, perform the following to connect the optical fibers between the client port and the SONET/GbE/Data add/drop optical port.

- Clean and connect the optical fibers to the required OUT connectors on the client port and the SONET/GbE/Data add/drop optical port.
- Measure the optical receive power of the optical fiber at the client port and the SONET/GbE/Data add/drop optical port using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for the optical specifications of the circuit packs and pluggable transmission modules.)
- Clean and connect the optical fibers to the required IN connectors on the client port and the SONET/GbE/Data add/drop optical port.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

7 **Important!** If the **Port Monitoring Mode** is provisioned to *NMON*, the client port is not monitored/alarmed and the client port will not automatically transition to the *IS* (in-service) state when a good signal (not LOS) is detected. If the **Port Monitoring Mode** is provisioned to *AUTO*, the client port automatically transitions to the *IS* (in-service) state when a good signal (not LOS) is detected, and the client port is monitored/alarmed. If the **Port Monitoring Mode** is provisioned to *IS*, the client port is monitored and alarms are reported.

At the terminating nodes, select **View** → **Equipment** to access the required client ports and verify the value of the **Port Monitoring Mode** parameter.

If required, select **Configuration** → **Equipment** to access client ports and change the value of the **Port Monitoring Mode** parameter.

Reference: Procedure 4-30: "Provision 10G Muxponder circuit pack SONET/GbE/Data client port" (p. 4-144)

END OF STEPS

Procedure 10-18: Delete SONET/GbE/Data client signal

Overview

Use this procedure to delete a SONET/GbE/Data client signal from a DWDM network.

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX is in service and that a client signal is being deleted.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 10-3) and "Required equipment" (p. 10-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the terminating nodes, SONET/GbE/Data signal add/drop optical port addresses and client signal port addresses to be deleted.

Steps

Complete the following steps to delete a SONET/GbE/Data client signal from a DWDM network.

1 Using the work instructions, determine the DWDM network configuration and identify the terminating nodes for the client signal to be deleted.

Important! It may be helpful to make a sketch of the DWDM network to visualize the path of the optical channel through the network.

2 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 **Important!** This step may activate the office alarms. The audible alarm may be suppressed by pressing the **ACO** push button.

At the terminating nodes, select **Configuration** → **Equipment** to access the required client signal port on the XM10G/8 circuit packs and provision the client signal port *Signal Type* parameter as **STNA**.

Result: The system reports an `unexpected or failed Pluggable Transmission Module` alarm. The circuit pack **FAULT** LED flashes and the port LED (if equipped) is lighted.

Reference: Procedure 4-30: "Provision 10G Muxponder circuit pack SONET/GbE/Data client port" (p. 4-144)

4 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the correct client signal port was provisioned as STNA.

5 At the terminating nodes, disconnect the optical fibers between the required client signal port and the SONET/GbE/Data add/drop optical port.

6 At the terminating nodes, remove the required pluggable transmission module from the XM10G/8 circuit packs and replace with a dust cover.

Result: The circuit pack **FAULT** LED and port LED (if equipped) go off.

7 At the terminating nodes, select **Configuration** → **Update System** → **Update States** to clear the alarms.

8 At the terminating nodes, click the **Alarm List** button to obtain an *NE Alarm List* and verify that the alarms are cleared.

END OF STEPS

11 Ethernet/Data network provisioning procedures

Overview

Purpose

This chapter includes procedures necessary to provision Ethernet and Data features in Alcatel-Lucent 1665 DMX.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: "Install software on the PC" (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

Required equipment

All procedures in this chapter require that the following equipment is available:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

Important! If additional equipment is required to perform a specific procedure, that additional equipment is listed in that procedure.

Procedure 11-1: Establishing Ethernet services

Overview

Use this procedure for examples on provisioning Ethernet services.

This procedure provides references to numerous examples for provisioning Ethernet services. They are intended to be used as reference only to provide you with general Ethernet related provisioning. The examples given may not match your particular configuration. It is impossible to provide examples for all the configurations you may use.

Important! This procedure assumes that the network system has already been established with all nodes of the network properly equipped and operating for standard SONET transmission.

Establishing/Removing Service

Use the examples provided in these procedures for establishing service. When removing service follow the reverse of the procedures.

Important! Under some circumstances, constant pause frames may be transmitted to the link partner when using the LNW63/64/74/87 circuit packs for service. When establishing service, if packets are being transmitted to the port before the circuit has been established with cross-connections and enabled tributaries, stuck pause frames may be sent to the link partner. When disabling service, if enough packets were previously transmitted to the port or continue to be transmitted to the port, stuck pause frames may be sent to the link partner.

- Enabling service — To prevent pause frames to the link partner, ensure that no traffic is being sent to the port before the full circuit has been established including all cross-connections made and the tributaries enabled. If this is not possible, use the *ed-eport* TL1 command **`admin`** parameter or the **Configuration → Equipment** command from the System View menu to provision **Port Administration Control** to DISABLE on the LAN port before establishing the cross-connections and enabling tributaries. After all cross-connections are made and the tributaries enabled, enable Port Administration Control.
- Disabling service — To prevent pause frames to the link partner, remove all traffic from the port first before disabling tributaries and/or deleting cross-connections. If this is not possible, use the *ed-eport* TL1 command **`admin`** parameter or the **Configuration → Equipment** command from the System View menu to provision **Port Administration Control** to DISABLE on the LAN port before disabling tributaries or removing cross-connections.

Restrictions

A Alcatel-Lucent 1665 Data Multiplexer equipped with LNW26B/28 OC-48 OLIUs (or functionally equivalent LNW77, LNW121–LNW159, LNW121B–LNW159B OC48 OLIUs) have a capacity limit of 24 STS-1s for Ethernet circuit packs installed in Function slots A, B, or C. Ethernet service assignments are restricted to VCG v1 and v2 on the LNW67/68 2GbE circuit packs when they are installed in Function slots A, B, or C. In slot D or Growth slot, VCGs v1, v2, v3, and v4 may be used.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter.
2. Obtain the work instructions for the Ethernet service being established.
3. Be familiar with Ethernet service provisioning or have complete work instructions detailing the particular service being established.

Steps

Perform the following steps to provision Ethernet services.

1 Click on the **Alarm List** button on the System View window and verify no alarms are present.

2 If any alarms are activated, they must be cleared prior to beginning this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 One at a time, use the *WaveStar*® CIT to log in to each Alcatel-Lucent 1665 DMX terminating end node. From the System View menu at each node, select **View** → **Equipment**.

Result: The *View Equipment* window opens.

4 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit group (A, B, C, D or G) at each Alcatel-Lucent 1665 DMX NE providing Ethernet service.

Reference:

- Procedure 4-12: “Install 10/100 Ethernet circuit packs” (p. 4-61)
- Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)

5 Note the following general order of provisioning requirements for the type of service being provisioned:

1. Use the **Configuration** → **Equipment** command from the System View menu or the *ed-eqpt* TL1 command to provision the following for each type of Ethernet circuit pack being provisioned:

   - Set VLAN Tagging Mode (NOTAG, 802.1TAG, TRANS, SWITCHED).

     Does not apply to the LNW71, LNW74, LNW63, LNW64 or LNW87 circuit packs since they are NOTAG (Private Line) only.

     802.1TAG or TRANS mode applies only to the LNW66/67/68 circuit packs.

     SWITCHED mode applies only to the LNW70/LNW170 and LNW78 circuit packs. SWITCHED mode allows for provisioning of 802.1TAG or TRANS on a virtual switch basis.

   - Set Ethernet Cross Connect Mode (STS1, STS3c, STS12c).

     Ethernet Cross Connect Mode applies only to the LNW70/LNW170, LNW71 and LNW78 circuit packs.

     STS1 mode: This is the initial value. Only virtual concatenation of STS-1 cross-connections can be used for the LNW71. For the LNW70/LNW170 and LNW78, STS-1 and virtual concatenation of STS-1s can be used.

     STS3c mode: STS-1 and STS-3c cross connections can be used, but at most one cross connection can be made to each VCG. Applies only to the LNW71 circuit pack.

     STS12c mode: only STS-3c and STS-12c cross connections can be used as well as virtual concatenations of STS-3c. Applies only to the LNW70/LNW170 and LNW78 circuit packs.

   - Select VT Virtual Concatenation mode for the LNW74 circuit pack only. Specifies the number of STS-1s dedicated to VT virtual concatenation. Value 0 specifies no VT concatenation, value of 12 specifies 12 STS1s are reserved for VT concatenation.

   - Set Ethernet Port Mode/Port Configuration.

     Ethernet Port Mode sets the following circuit pack Ethernet ports to operate with different types of PTMs (pluggable transmission modules).

     GX_FX mode: For the LNW70/LNW170, sets ports 1-4 to operate with optical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs. For the LNW78, sets ports 1-2 to operate with optical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs.

     GT_FX mode: For the LNW70/LNW170, sets ports 1-4 to operate with electrical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs. For the LNW78, sets ports 1-2 to operate with electrical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs.

FT_FX mode: For the LNW70/LNW170, sets ports 1-4 to operate with electrical FE PTMs. Sets ports 5-8 to operate with optical FE PTMs. For the LNW74, enables electrical FE backplane ports 1-16 and sets ports 17-24 to operate with optical FE PTMs. Provisionable for the LNW74 only when the main slots are equipped with VLF OLIU circuit packs.

FX mode: For the LNW74, disables electrical FE backplane ports 1-16 and sets ports 17-24 to operate with optical FE PTMs. Provisionable for the LNW74 only when the main slots are equipped with VLF OLIU circuit packs.

GX_FT mode: For the LNW70/LNW170, sets ports 1-4 to operate with optical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs. For the LNW78, sets ports 1-2 to operate with optical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs.

GT_FT mode: For the LNW70/LNW170, sets ports 1-4 to operate with electrical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs. For the LNW78, sets ports 1-2 to operate with electrical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs.

FT mode: For the LNW70/LNW170, sets ports 1-8 to operate with electrical FE PTMs.

GX mode: For the LNW63 sets ports 1-4 to operate with optical GbEs PTMs. For the LNW64, sets ports 1-8 to operate with optical GbE PTMs.

GT mode: For the LNW63, sets ports 1-4 to operate with electrical GbE PTMs. For the LNW64, sets ports 1-8 to operate with electrical GbE PTMs.

GT_GX mode: For the LNW64, sets ports 1-4 to operate with electrical GbE PTMs. Sets ports 5-8 to operate with optical GbE PTMs.

- Set Line Rate.

  Line Rate sets the following individual circuit pack Ethernet ports to operate with different types of PTMs (pluggable transmission modules).

  GX mode: For the LNW87, sets the port to operate with optical GbE PTMs.

  GT mode: For the LNW87, sets the port to operate with electrical GbE PTMs.

  FT mode: For the LNW87, sets the port to operate with electrical FE PTMs.

  FX mode: For the LNW87, sets the port to operate with optical FE PTMs.

Burst and Credit Interval values may also be specified at this time for the LNW66/67/68 circuit packs. If required, also assign Alarm Severity Assignment Profiles.

2. Create Virtual Switches and assign ports (must be done second, if required [does not apply to the NOTAG mode or LNW71, LNW74, LNW63, LNW64 or LNW87 circuit packs]).

   For the LNW70/LNW170 and LNW78, if VLAN Tagging Mode is set to SWITCHED, then select the Virtual LAN Tagging Mode (802.1TAG or Transparent) for each virtual switch created.

3. Establish SONET cross-connections.

4. Create Spanning Tree groups and assign ports (does not apply to the NOTAG mode). Does not apply to LNW71, LNW74, LNW63, LNW64 or LNW87 circuit packs.

5. Establish VLANs and assign ports (802.1Q Tag Mode ONLY). Does not apply to LNW71, LNW74, LNW63, LNW64 or LNW87 circuit packs.
6. Assign port tags (Transparent Tag mode ONLY). Does not apply to LNW71, LNW74, LNW63, LNW64 or LNW87 circuit packs.

6 Refer to the procedures in this chapter as examples for the service being provided.

END OF STEPS

Procedure 11-2: Establish point-to-point UPSR protected 1GbE full rate private line service (NOTAG mode)

Overview

This procedure provides an example for configuring point-to-point UPSR protected GbE full rate private line Ethernet service using the NOTAG tagging mode. See Figure 11-1, "Point-to-Point 1GbE full rate private line example" (p. 11-16) for an example.

This example indicates a full Gigabit bandwidth of 21 STS1s. For the LNW67/68 circuit packs the VCGs are paired when using path protected cross-connections. For the LNW70/LNW170/LNW63/LNW64/LNW87 circuit packs, there is no pairing of VCGs and each VCG may have from 1 to 21 STS1s cross-connected to support the bandwidth assignment.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

> **Important!** On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter. You must also have complete work instructions that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.

Steps

Use this procedure as an example for configuring a point-to-point UPSR protected 1GbE full rate private line service (NOTAG mode). See Figure 11-1, "Point-to-Point 1GbE full rate private line example" (p. 11-16) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the network (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 

NOTICE

Service-disruption hazard

If the Ethernet circuit pack is already providing service, changing tagging mode will take down any existing service. The existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode, and other parameters.

6 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.
the tagging mode is set correctly to NOTAG but other parameters are not correct,	Proceed to Step 9.
the tagging mode is NOT set to NOTAG,	Continue with Step 7.

7 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

8 If required, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

9 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

10 Verify/Select **NOTAG** in the Select VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** [LNW70/LNW170], **Port Configuration** [LNW63/64/70]), and **Line Rate** (LNW87) as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! Note that full rate Gigabit service requires 21 STS-1 or equivalent cross-connections.

13 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

For the LNW70/LNW170/LNW63/LNW64/LNW87 circuit packs, a VCG may have a bandwidth up to 21 STS1s. Also, there is no pairing of VCGs.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

14 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

15 **Important!** For LNW63/64/70/74/87 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

Use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

16 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

17 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

18 **Important!** For LNW63/64/70/74/87 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

19 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

20 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 21.

- If the VCG Monitoring Mode is **Not Monitored**,
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **Auto** for the **VCG Monitoring Mode**.

3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 19.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

21 PROVISION LAN PORTS

Use the TL1 **ed-eport** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

22 Click **Apply**. Read the warning message, then click **Yes** to execute the command.

23 PROVISION VCGS

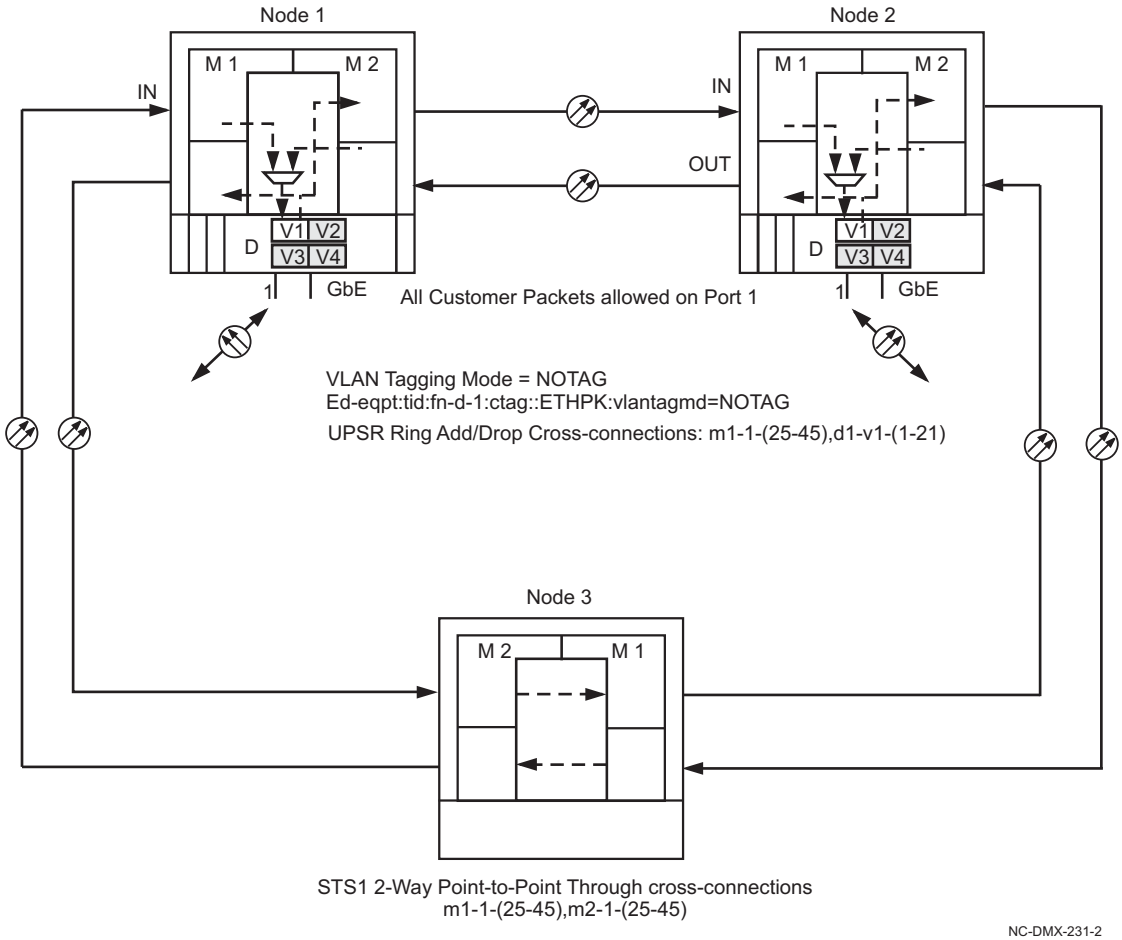
Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the previous step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: “Provision Ethernet VCG parameters” (p. 11-89)

24 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit or repeat from Step 21 for other port provisioning.

END OF STEPS

Figure 11-1 Point-to-Point 1GbE full rate private line example



Procedure 11-3: Establish point-to-point UPSR protected GbE service (802.1q mode)

Overview

This procedure provides an example for configuring point-to-point UPSR protected GbE Ethernet service using the 802.1q tagging mode. See Figure 11-2, "Point-to-Point GbE using 802.1q tagging mode" (p. 11-25) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (802.1q) and virtual switch ID.

Steps

Use this procedure as an example for configuring point-to-point UPSR protected GbE Ethernet service using the 802.1q tagging mode. See Figure 11-2, "Point-to-Point GbE using 802.1q tagging mode" (p. 11-25) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the network (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 

NOTICE

Service-disruption hazard

If the Ethernet circuit pack is already providing service, changing tagging mode will take down any existing service. The existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68 circuit packs must be set to 802.1TAG. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to SWITCHED.

6 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.

If...	Then...
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 9.
the tagging mode is NOT set correctly,	Continue with Step 7.

7 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

8 If required, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

9 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

10 Verify/Select the tagging mode in the Select VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12 

NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

Creating virtual switches using the **`ent-vrtsw`** TL1 command or **Configuration** → **Data** → **Create Virtual Switch** command from the System View menu requires you to select the circuit pack and provision the following parameters :

- **Virtual Switch ID** (**`vrtswid`**) - Value in the range of 1-4095 for the LNW66/67/68 circuit packs. Value in the range of 1-16 for the LNW70/LNW170 circuit packs.
- **Virtual LAN Tagging Mode** (**`tagmd`**) - Value of **`802.1TAG`** or **`Transparent`**. Applies to LNW70/LNW170 only.
- **Ethernet (LAN) Ports** (**`eplst`**) - List or selection of LAN ports associated with the virtual switch ID.
- **VCG (WAN) Ports** (**`vcglst`**) - List or selection of VCG ports associated with the virtual switch ID.

CREATE VIRTUAL SWITCH

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select **802.1TAG** for the **Virtual LAN Tagging Mode**.
- For circuit packs not yet in service with a virtual switch assigned:
  - If a different virtual switch ID is required, use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **802.1TAG** for the **Virtual LAN Tagging Mode**.

- For circuit packs in service with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **802.1TAG** for the **Virtual LAN Tagging Mode**.

13 

NOTICE

Service-disruption hazard

In Release 3.0 and earlier, additional STS-1 cross-connection capacity may NOT *be added to an in-service Ethernet circuit pack without service interruption.*

ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! Note that full rate Gigabit service requires 21 STS-1 or equivalent cross-connections.

14 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204)

15 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

16 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **ed-vcgtrib** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **Enabled** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

17 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

18 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 **Important!** For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

20 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

21 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 22.

- If the VCG Monitoring Mode is **Not Monitored**,

Perform the following:

1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **Auto** for the **VCG Monitoring Mode**.
3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 19.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

22



NOTICE

Service-disruption hazard

After the VLAN ID for customer untagged frames is assigned and service is established in the 802.1q mode, changing the VLAN ID may affect service. If the VLAN IDs are different, service will be affected.

When the VLAN ID for customer untagged frames is changed at one point in the network, the VLAN ID must be changed at all points.

ASSIGN VLAN IDs

Use the TL1 **ent-vlan** command to assign the default VLAN ID for customer untagged frames or the customer VLAN ID for tagged frames to the associated LAN ports and VCG WAN ports. Or select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu.

Reference: For example, see Figure 11-2, "Point-to-Point GbE using 802.1q tagging mode" (p. 11-25).

Assume a GbE circuit pack is installed in Function slot d-1 and LAN port 2 at each circuit pack is used for service.

Note that a service has been established between Node 1 and Node 2 for customer untagged frames using a default VLAN ID of 34.

Note that a service has been established between Node 1 and Node 2 for customer tagged frames using a VLAN ID of 55.

23 PROVISION LAN PORTS

Use the TL1 **ed-eport** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

24 Click **Apply**. Read the warning message, then click **Yes** to execute the command.

25 PROVISION VCGS

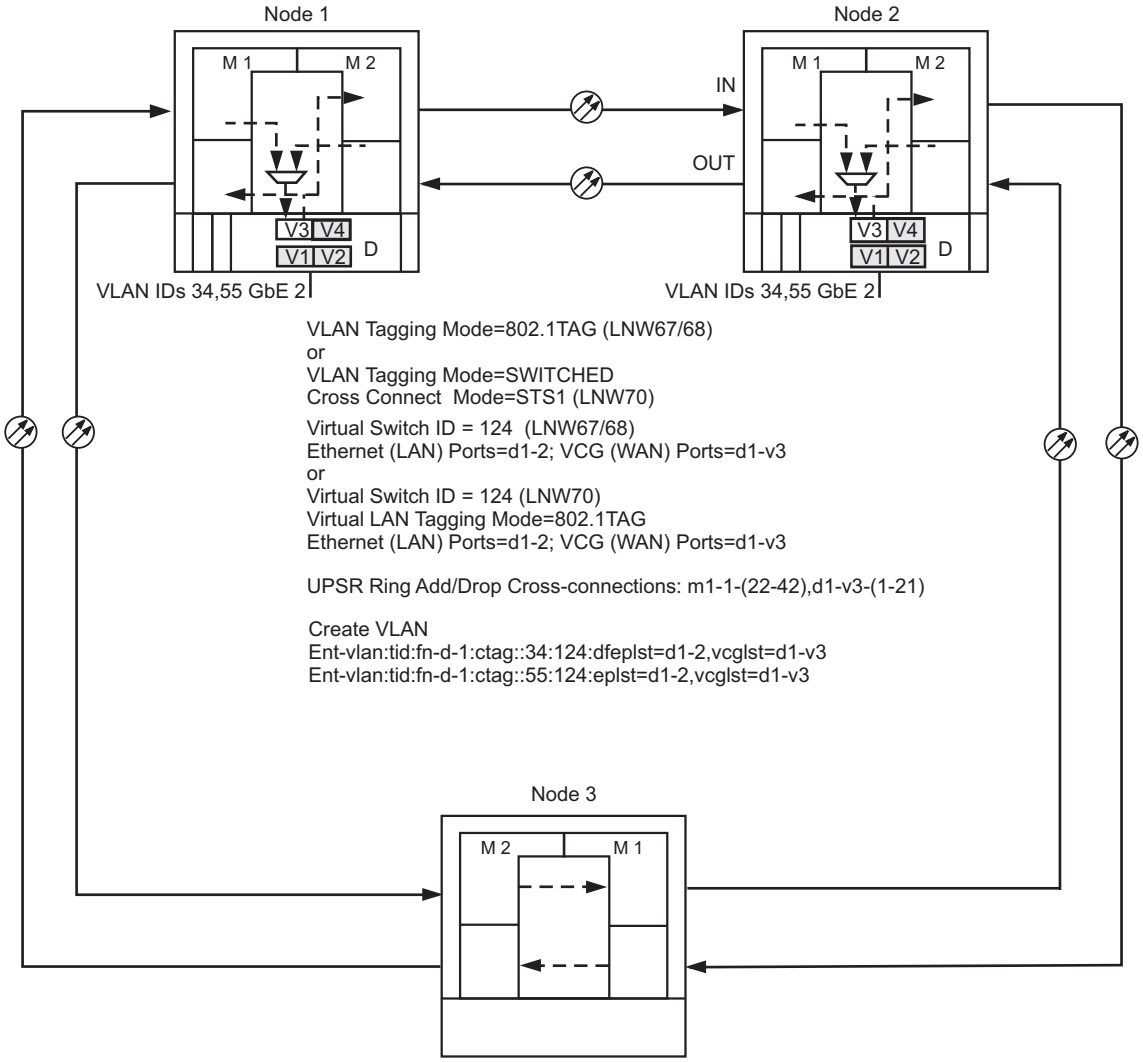
Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the previous step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

26 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit or repeat from Step 23 for other port provisioning.

END OF STEPS

Figure 11-2 Point-to-Point GbE using 802.1q tagging mode



Procedure 11-4: Establish point-to-point UPSR protected GbE service (transparent mode)

Overview

This procedure provides an example for configuring point-to-point UPSR protected GbE Ethernet service using the Transparent tagging mode. See Figure 11-3, "Point-to-Point GbE using transparent tagging mode" (p. 11-34) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (transparent) and virtual switch ID.

Steps

Use this procedure as an example for configuring point-to-point UPSR protected GbE Ethernet service using the Transparent tagging mode.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 

NOTICE

Service-disruption hazard

If the Ethernet circuit pack is already providing service, changing tagging mode will take down any existing service. The existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68 circuit packs must be set to **`TRANS`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

6 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.

If...	Then...
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 9.
the tagging mode is NOT set correctly,	Continue with Step 7.

7 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

8 If required, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

9 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

10 Verify/Select the tagging mode in the Select VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12 **NOTICE**

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

Creating virtual switches using the **`ent-vrtsw`** TL1 command or **Configuration** → **Data** → **Create Virtual Switch** command from the System View menu requires you to select the circuit pack and provision the following parameters :

- **Virtual Switch ID** (**`vrtswid`**) - Value in the range of 1-4095 for the LNW66/67/68 circuit packs. Value in the range of 1-16 for the LNW70/LNW170 circuit packs.
- **Virtual LAN Tagging Mode** (**`tagmd`**) - Value of **`802.1TAG`** or **`Transparent`**. Applies to LNW70/LNW170 only.
- **Ethernet (LAN) Ports** (**`eplst`**) - List or selection of LAN ports associated with the virtual switch ID.
- **VCG (WAN) Ports** (**`vcglst`**) - List or selection of VCG ports associated with the virtual switch ID.

ASSIGN VIRTUAL SWITCH ID

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.

- For circuit packs in service with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.

13 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! Note that full rate Gigabit service requires 21 STS-1 or equivalent cross-connections.

14 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204)

15 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

16 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

Use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **Enabled** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

17 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

18 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19

Important! For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

20 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

21 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 22.

- If the VCG Monitoring Mode is **Not Monitored**,

Perform the following:

1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **Auto** for the **VCG Monitoring Mode**.
3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 19.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

22 CREATE PORT TAGs

Use the TL1 **`ed-eport`** and **`ed-vcg`** commands to assign port tags to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create Port Tag** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.

Important! The Peak Information Rate (PIR) rate limiting feature on the LNW66/LNW67/LNW68 circuit packs will not be effective in transparent mode if the Ethernet Type (ethertype) parameter for the LAN or WAN VCG ports is provisioned to any value other than FFFF or 8100.

23 PROVISION LAN (Ethernet) PORTS

Use the TL1 **ed-eport** command to provision parameters for the LAN port being provisioned. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit or continue with the next step.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

24 PROVISION WAN (VCG) PORTS

Use the TL1 **ed-vcg** command to provision parameters for the VCG ports, as required. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

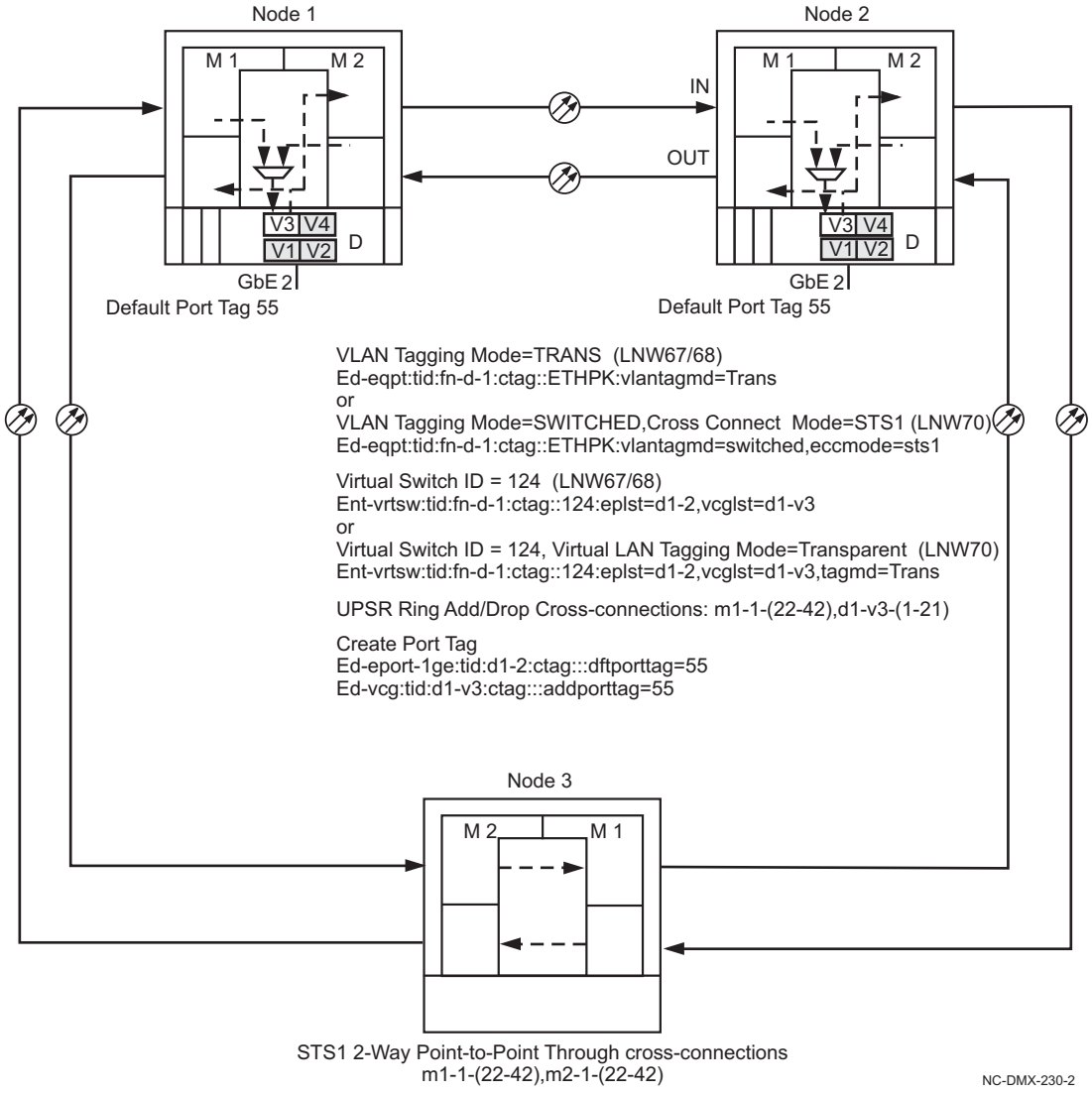
25 Note that this procedure provided the following example of point-to-point UPSR protected GbE service using Transparent tagging mode.

Reference: In Figure 11-3, "Point-to-Point GbE using transparent tagging mode" (p. 11-34), assume a GbE circuit pack is installed in Function slot fn-d-1 and LAN port 2 at each circuit pack is used for service.

Note that a service has been established between Node 1 and Node 2 with a default port tag of 55.

END OF STEPS

Figure 11-3 Point-to-Point GbE using transparent tagging mode



Procedure 11-5: Establish Ethernet packet ring on a UPSR

Overview

This procedure provides an example for establishing an Ethernet packet ring on a unidirectional path switched ring (UPSR) using LNW66/67/68 or LNW70/LNW170 circuit packs. A packet ring is a set of Ethernet switches (Ethernet circuit packs) connected to each other in a ring configuration. When the packet ring is first established, the capacity of the ring is predetermined by the number of STS-1 cross-connections (1-21 [LNW66/67/68], 1-48 [LNW70/LNW170}) applied to the ring and switches. The tagging mode (**802.1TAG** or Transparent [**Trans**]), virtual switch ID, and spanning tree group is also predetermined. For example, see Figure 11-4, “Ethernet packet ring on a UPSR” (p. 11-43).

This procedure assumes that the UPSR ring network configuration has already been established and no alarms are present.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to “Before you begin” (p. 11-4) and “Required equipment” (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the nodes participating in the packet ring network.
- The shelf slots, circuit packs, ports, and VCGs involved in the packet ring network.
- The number and type of cross-connections to be made at each node.
- The tagging mode (transparent or 802.1q), virtual switch ID, and spanning tree group ID.

Steps

Use this procedure as an example to establish an Ethernet packet ring on a UPSR ring. See Figure 11-4, “Ethernet packet ring on a UPSR” (p. 11-43) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the packet ring being established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Reference: Procedure 4-12: "Install 10/100 Ethernet circuit packs" (p. 4-61)

Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 CONFIGURE TAGGING MODE

Determine the existing tagging mode for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW66/67/68 circuit packs must be set to **`TRANS`** or **`802.1TAG`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

Important! When GbE circuit packs are installed in the shelf, the default "NOTAG" mode is assigned to the circuit pack. When non private line FE circuit packs are installed in the shelf, the default "802.1TAG" mode is assigned to the circuit pack.

7

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 13.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

9 If required, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click Select. Highlight the VRTSW ID being deleted, then click **Apply** .

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

10 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

11 Verify/Select the tagging mode (**`802.1TAG`**, **`TRANS`** [LNW66,67,68], or **`SWITCHED`** [LNW70/LNW170]) in the VLAN Tagging Mode box.

12 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW66/67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: “Provision Ethernet circuit pack parameters” (p. 11-103)

13 

NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

Creating virtual switches using the **`ent-vrtsw`** TL1 command or **Configuration** → **Data** → **Create Virtual Switch** command from the System View menu requires you to select the circuit pack and provision the following parameters :

- **Virtual Switch ID** (**`vrtswid`**) - Value in the range of 1-4095 for the LNW66/67/68 circuit packs. Value in the range of 1-16 for the LNW70/LNW170 circuit packs.
- **Virtual LAN Tagging Mode** (**`tagmd`**) - Value of **`802.1TAG`** or **`Transparent`**. Applies to LNW70/LNW170 only.
- **Ethernet (LAN) Ports** (**`eplst`**) - List or selection of LAN ports associated with the virtual switch ID.
- **VCG (WAN) Ports** (**`vcglst`**) - List or selection of VCG ports associated with the virtual switch ID.

ASSIGN VIRTUAL SWITCH ID

- *For circuit packs not yet in service with no virtual switch assigned:*
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).
- *For circuit packs not yet in service with a virtual switch assigned:*
  - Use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

- *For circuit packs in service, on only one set of ports, with a virtual switch assigned:*
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

14

NOTICE

Service-disruption hazard

In Release 3.0 and earlier, additional STS-1 cross-connection capacity may NOT *be added to an in-service Ethernet circuit pack without service interruption.*

ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each Ethernet terminating node and any pass-through cross-connections to be made at any non terminating nodes in the network.

15 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each non terminating node to provision the **`2-Way Point-to-Point, Through`** pass-through cross-connections. Use the Cross-Connection Wizard at each terminating node to provision the Ethernet **`Multipoint`** (unswitched) cross-connections. For example, see Figure 11-4, “Ethernet packet ring on a UPSR” (p. 11-43).

Reference: Refer to Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204) for cross-connection examples.

16 From the System View menu, select **View** → **Cross-Connections** to verify that the proper connections have been made.

17 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

Use the TL1 **ed-vcgtrib** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **Enabled** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

18 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

19 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

20

Important! For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

21 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

22 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 23.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 20.
- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 CREATE SPANNING TREE GROUP

If required, determine a preferred spanning tree configuration (span to be blocked under nominal conditions), the preferred root node, and spanning tree root priorities for this service.

Important! Note that it is not necessary to determine a preferred spanning tree configuration. A default spanning tree configuration is configured when you establish the spanning tree group.

Reference: Procedure 11-25: "Create preferred spanning tree configuration" (p. 11-224)

24 Use the TL1 command **ent-stgrp** to assign and provision the parameters for the ports involved in the spanning tree group. Or select **Configuration** → **Data** → **Create Spanning Tree Group** command from the CIT System View menu. For example, see Figure 11-4, "Ethernet packet ring on a UPSR" (p. 11-43).

Important! Networks running 802.1d STP support a maximum of up to nine nodes participating in a spanning tree. Networks with more than nine nodes will not reconfigure properly. Spanning tree default parameters support a network of up to nine nodes.

Networks running 802.1w rapid spanning tree protocol (Release 2 or later) support more than nine nodes participating in a spanning tree. To support more than nine nodes in the spanning tree, the maximum age timer must be increased. Note that spanning tree restoration time increases as the number of nodes increase.

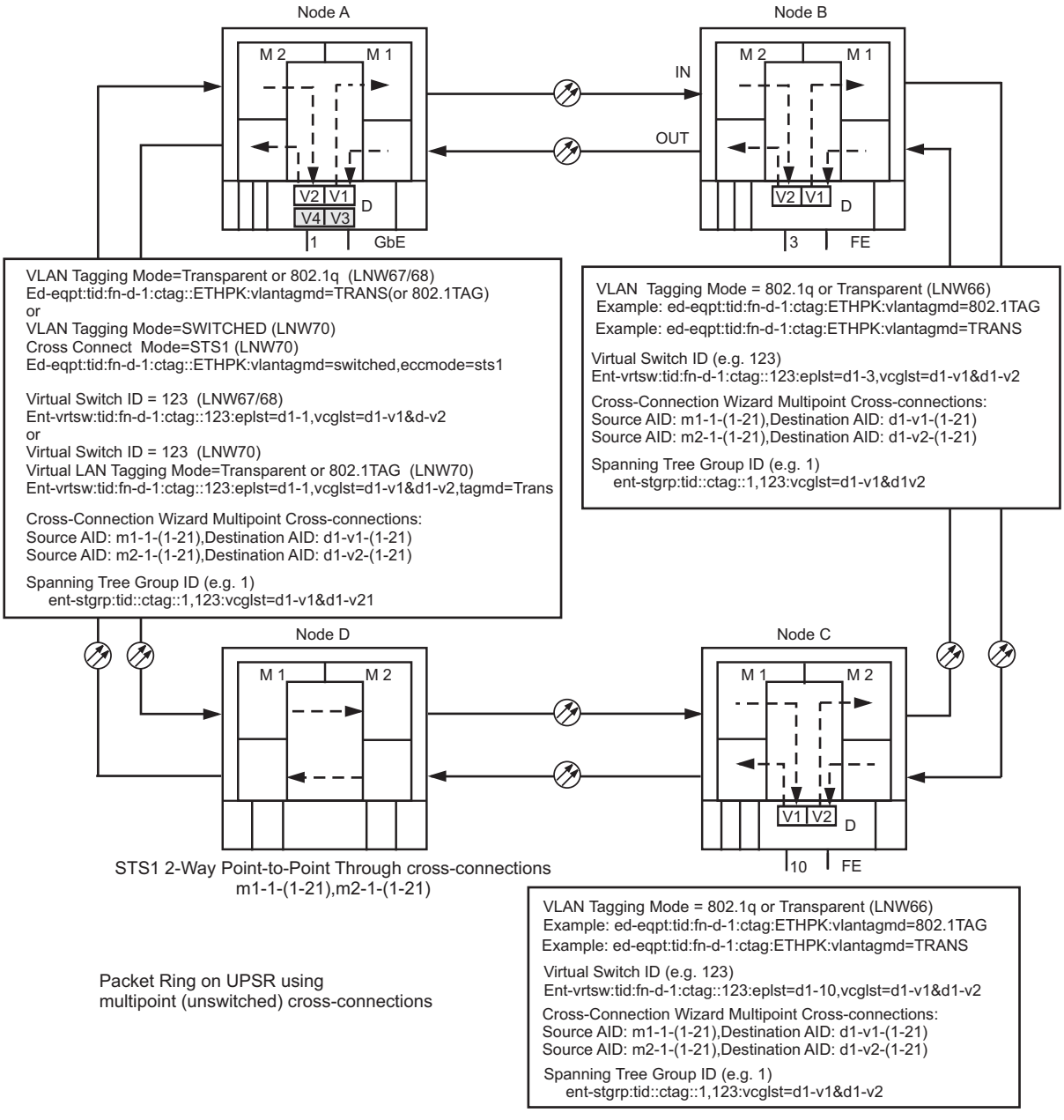
If the network consists of more than nine (9) nodes which are participating in the spanning tree configuration, use the following formula to determine the proper setting for the spanning tree maximum age timer (**stmaxage**): 2N + 6, where N equals the number of nodes.

For example, if the network consists of 20 nodes, then the **stmaxage** timer should be set to 46 seconds: 2 x (20) + 6= 46.

25 Repeat all the assignments in this procedure at each Ethernet node in the network.

END OF STEPS

Figure 11-4 Ethernet packet ring on a UPSR



Procedure 11-6: Establish 802.1q mode Ethernet service on established packet ring (UPSR)

Overview

This procedure provides an example for configuring Ethernet service using the 802.1q tagging mode on an established packet ring. See Figure 11-5, "Example 1 service on UPSR using 802.1q tagging mode" (p. 11-47) and Figure 11-6, "Example 2 service on UPSR using 802.1q tagging mode" (p. 11-48) for examples.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! The packet ring must already be established on the UPSR before continuing. This procedure assumes the packet ring is established with the necessary tagging modes, virtual switch IDs, cross-connections, and spanning tree groups established. See Procedure 11-5: "Establish Ethernet packet ring on a UPSR" (p. 11-35).

On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (802.1q) and virtual switch ID.
- The VLAN IDs being assigned.

Steps

Use this procedure as an example for configuring Ethernet service on a UPSR protected packet ring using the 802.1q tagging mode. See Figure 11-5, "Example 1 service on UPSR using 802.1q tagging mode" (p. 11-47) and Figure 11-6, "Example 2 service on UPSR using 802.1q tagging mode" (p. 11-48) for examples.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, virtual switch ID, and VLAN IDs associated with the service being established.

5 

NOTICE

Service-disruption hazard

After the VLAN ID for customer untagged frames is assigned and service is established in the 802.1q mode, changing the VLAN ID may affect service. If the VLAN IDs are different, service will be affected.

When the VLAN ID for customer untagged frames is changed at one point in the network, the VLAN ID must be changed at all points.

ASSIGN VLAN IDs TO ESTABLISH SERVICE

Use the TL1 **ent-vlan** command to assign the default VLAN ID for customer untagged frames or the customer VLAN ID for tagged frames to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. For example, see Figure 11-5, "Example 1 service on UPSR using 802.1q tagging mode" (p. 11-47).

Important! When configuring a multipoint service in 802.1q mode, if spanning tree BPDUs from a customer are to be transported across the network, then the same default VLAN must be assigned to all ports associated with the multipoint service.

Reference: In Figure 11-5, "Example 1 service on UPSR using 802.1q tagging mode" (p. 11-47), assume a GbE circuit pack is installed in Function slot d-1 at Node A using LAN port 1. Assume FE circuit packs are installed in Function slot d-1 at Node B (using LAN port 3) and at Node C (using LAN port 10). Assume the packet ring has already been established.

Note that a service has been established between Node C, Node B, and Node A for customer tagged frames using a VLAN ID of 55.

6 PROVISION LAN PORTS

Use the TL1 **ed-eport** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

7 PROVISION VCGS

Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-5 Example 1 service on UPSR using 802.1q tagging mode

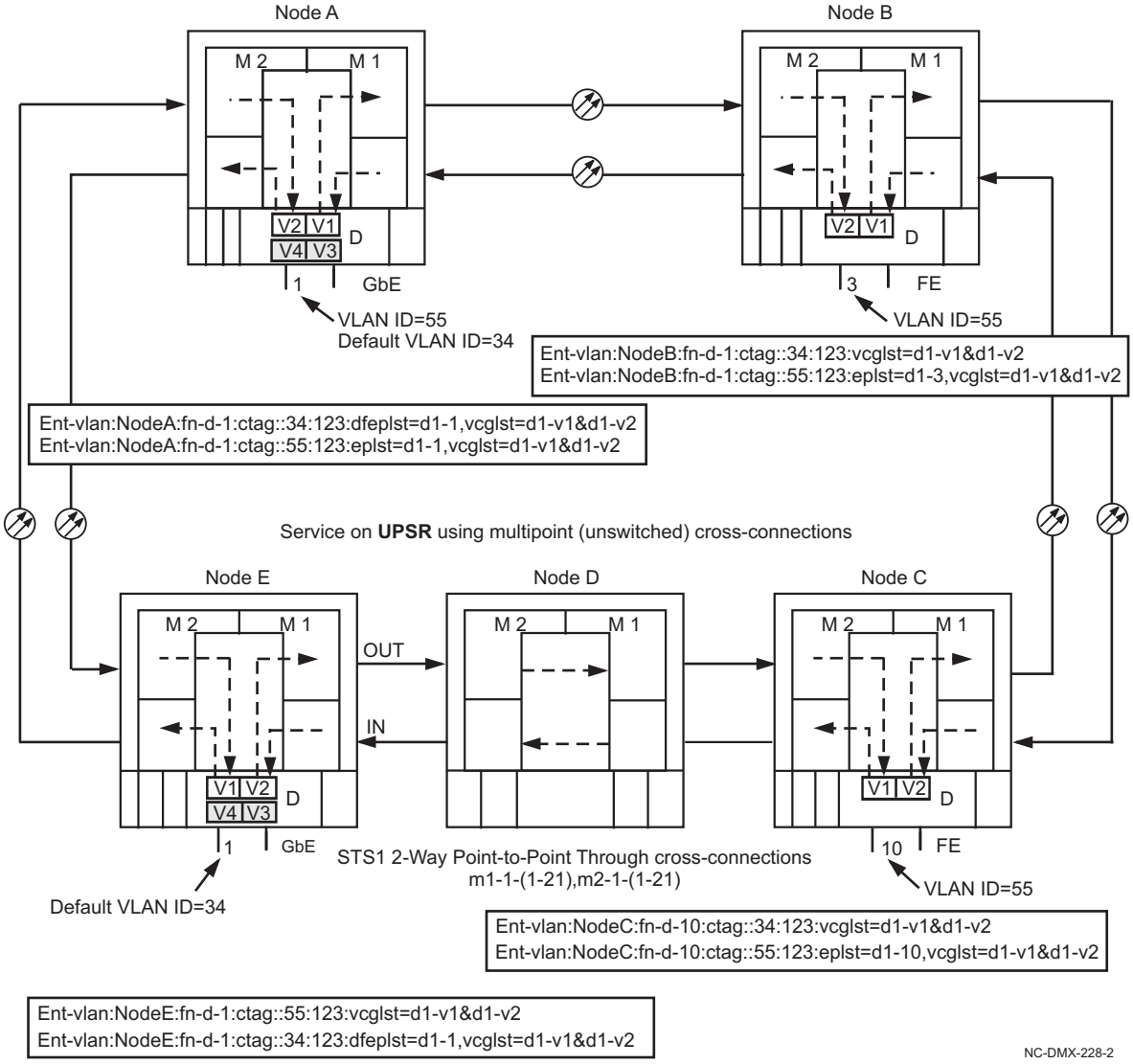
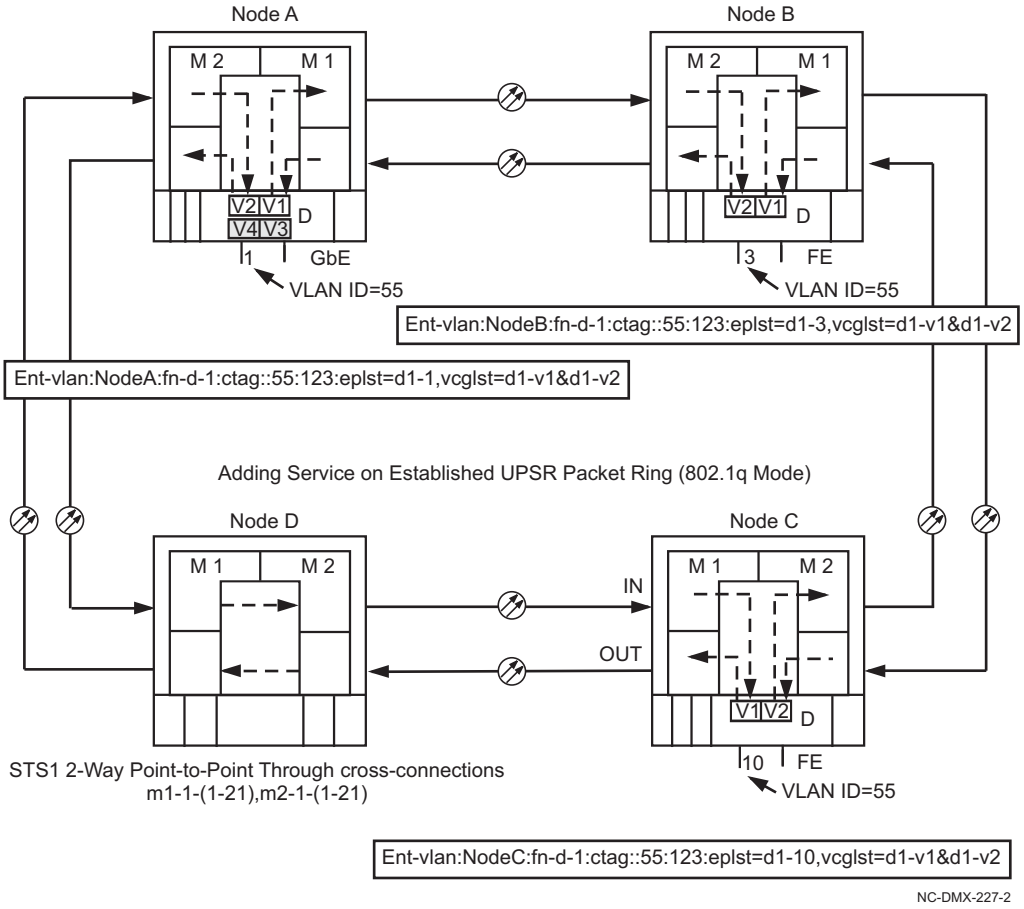


Figure 11-6 Example 2 service on UPSR using 802.1q tagging mode



Procedure 11-7: Establish transparent mode Ethernet service on established packet ring (UPSR)

Overview

This procedure provides an example for configuring Ethernet service using the Transparent tagging mode on an established packet ring. See Figure 11-7, “Example service on UPSR using transparent tagging mode” (p. 11-52) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! The packet ring must already be established on the UPSR before continuing. This procedure assumes the packet ring is established with the necessary tagging modes, virtual switch IDs, cross-connections, and spanning tree groups established. See Procedure 11-5: “Establish Ethernet packet ring on a UPSR” (p. 11-35).

On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment. See "Auto-negotiation disable" (5-3) in Chapter 5, "Ethernet" for more information.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to “Before you begin” (p. 11-4) and “Required equipment” (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (Transparent) and virtual switch ID.
- The Port Tags being assigned.

Steps

Use this procedure as an example for configuring Ethernet service on a UPSR protected packet ring using the Transparent tagging mode. See Figure 11-7, "Example service on UPSR using transparent tagging mode" (p. 11-52) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, virtual switch ID, and VLAN IDs associated with the service being established.

5 CREATE PORT TAGs

Use the TL1 **`ed-eport`** and **`ed-vcg`** commands to assign port tags to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create Port Tag** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.

Important! The Peak Information Rate (PIR) rate limiting feature on the LNW66/LNW67/LNW68 circuit packs will not be effective in transparent mode if the Ethernet Type (ethertype) parameter for the LAN or WAN VCG ports is provisioned to any value other than FFFF or 8100.

6 PROVISION LAN (Ethernet) PORTS

Use the TL1 **ed-eport** command to provision parameters for the LAN port being provisioned. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit or continue with the next step.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

7 PROVISION WAN (VCG) PORTS

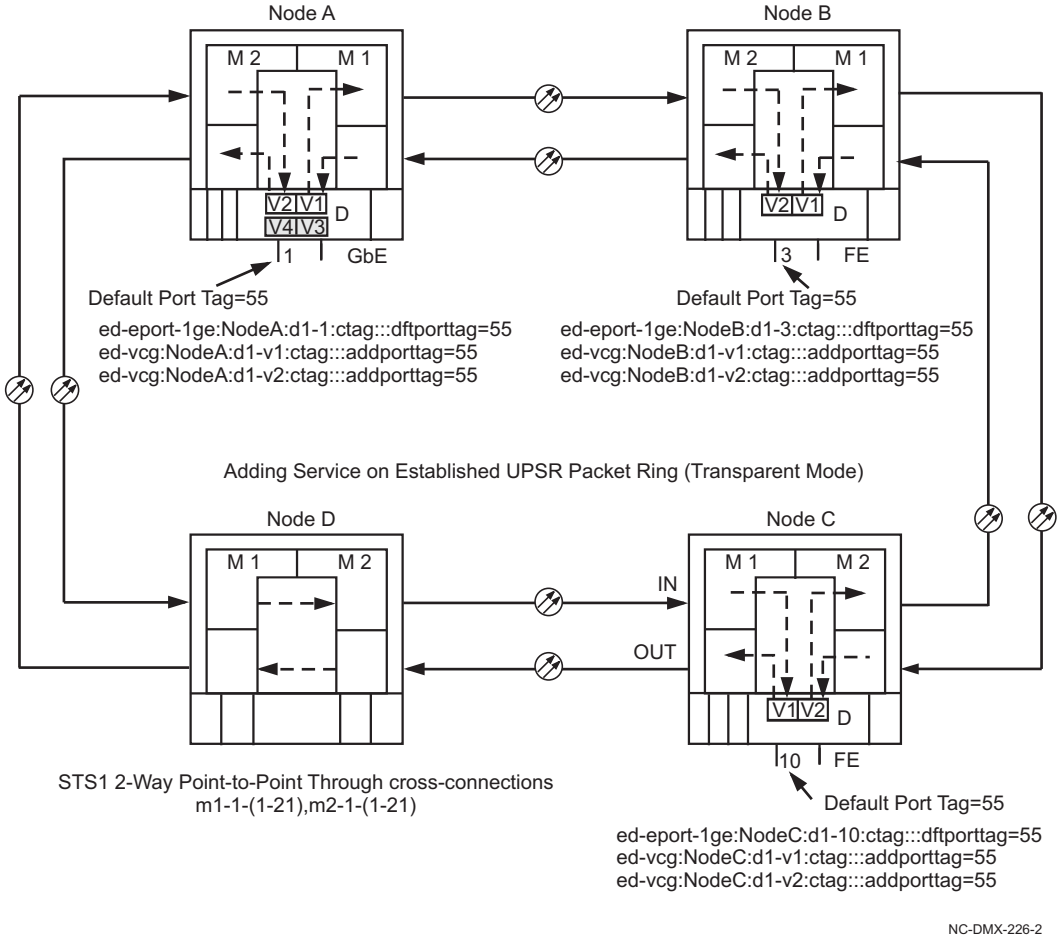
Use the TL1 **ed-vcg** command to provision parameters for the VCG ports, as required. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-7 Example service on UPSR using transparent tagging mode



Procedure 11-8: Establish Ethernet packet ring on a BLSR without NUT

Overview

This procedure provides an example for establishing an Ethernet packet ring on a bidirectional line switched ring (BLSR) without using Nonpreemptible Unprotected Traffic (NUT) access (Release 3 and later). A packet ring is a set of Ethernet switches (Ethernet circuit packs) connected to each other in a ring configuration. When the packet ring is first established, the capacity of the ring is predetermined by the number of STS-1 cross-connections (1-21 [LNW67/68], 1-48 [LNW70/LNW170]) applied to the ring and switches. The tagging mode, virtual switch ID, and spanning tree group is also predetermined. For example, see Figure 11-8, "SONET layer BLSR protected Ethernet packet ring on a BLSR without NUT" (p. 11-61).

This procedure assumes that the BLSR ring network configuration has already been established and no alarms are present.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters.

Important! This configuration is only possible using the LNW67/68/70 GbE circuit packs. The LNW70/LNW170 circuit pack allows cross-connections to any of the 32 VCGs in SWITCHED mode. On the LNW67/68 circuit packs, cross-connections must be made to both VCG 1 and VCG 3, therefore requiring all 4 VCGs. The LNW66 FE circuit pack only has 2 VCGs. No multipoint cross-connections are allowed in this configuration.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the nodes participating in the packet ring network.
- The shelf slots, circuit packs, ports, VCGs involved in the packet ring network.
- The number and type of cross-connections to be made at each node.

  For circuit packs not supporting LCAS, once the capacity of the packet ring is established, additional capacity (cross-connections) may not be added in service without service interruption.
- The tagging mode (transparent or 802.1q), virtual switch ID, and spanning tree group ID.

Steps

Use this procedure as an example to establish an Ethernet packet ring on a BLSR ring. See Figure 11-8, "SONET layer BLSR protected Ethernet packet ring on a BLSR without NUT" (p. 11-61) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** to retrieve a node-to-node listing of every node in the network.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Routing Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the packet ring being established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 **Important!** If the Ethernet circuit pack is already in service, the existing tagging mode cannot be changed without removing all existing service.

CONFIGURE TAGGING MODE

Determine the existing tagging mode for the circuit pack being provisioned. Use the TL1 **rtrv-eqpt** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68 circuit packs must be set to **TRANS** or **802.1TAG**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **SWITCHED**.

Important! When GbE circuit packs are installed in the shelf, the default "NOTAG" mode is assigned to the circuit pack.

7 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **rtrv-vrtsw** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

9 If required, use the TL1 **dlt-vrtsw** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click Select. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

10 Use the TL1 **ed-eqpt** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

Verify/Select the tagging mode (**802.1TAG**, **TRANS** [LNW66,67,68], or **SWITCHED** [LNW70/LNW170]) in the VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

ASSIGN VIRTUAL SWITCH ID

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **ent-vrtsw** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.
    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **dlt-vrtsw** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.
    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

13 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating node and any pass-through cross-connections to made at any non terminating nodes in the network.

14 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard to provision the **`2F BLSR Add/Drop`** Ethernet and **`2-Way Point-to-Point, Through`** pass-through cross-connections. For example, see Figure 11-8, "SONET layer BLSR protected Ethernet packet ring on a BLSR without NUT" (p. 11-61).

Important! Cross-connections at the terminating nodes must be made to both VCG 1 and VCG 3.

Reference: Refer to Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204) for cross-connection examples.

15 From the System View menu, select **View** → **Cross-Connections** to verify that the proper connections have been made.

16 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**`inmbs`**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**`outmbs`**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

17 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

18 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 **Important!** For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

20 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

21 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 22.

- If the VCG Monitoring Mode is **NMON** (Not monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 19.
- If the VCG Monitoring Mode is **AUTO**:
  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

– Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

– If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

22 CREATE SPANNING TREE GROUP

If required, determine a preferred spanning tree configuration (span to be blocked under nominal conditions), the preferred root node, and spanning tree root priorities for this service.

Important! It is not necessary to determine a preferred spanning tree configuration. A default spanning tree configuration is configured when you establish the spanning tree group.

Reference: Procedure 11-25: “Create preferred spanning tree configuration” (p. 11-224)

23 Use the TL1 **`ent-stgrp`** command to assign and provision the parameters for the ports involved in the spanning tree group. Or select **Configuration** → **Data** → **Create Spanning Tree Group** command from the CIT System View menu. For example, see Figure 11-8, “SONET layer BLSR protected Ethernet packet ring on a BLSR without NUT” (p. 11-61).

Important! Both VCGs at each terminating node must be part of the same spanning tree group.

Spanning tree default parameters support a network of up to nine nodes.

Networks running 802.1w rapid spanning tree protocol (Release 2 or later) support more than nine nodes participating in a spanning tree. To support more than nine nodes in the spanning tree, the maximum age timer must be increased. Note that spanning tree restoration time increases as the number of nodes increase.

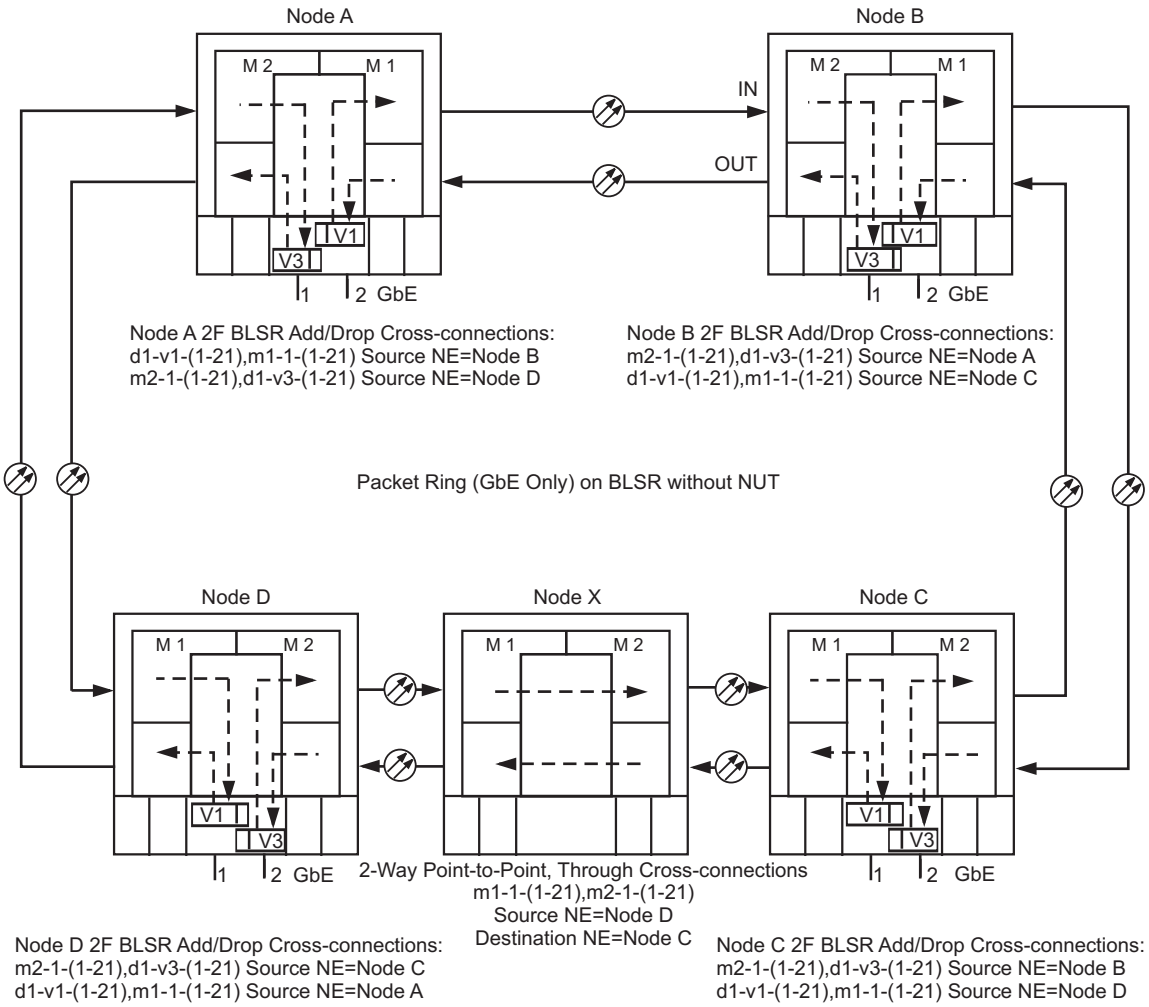
If the network consists of more than nine (9) nodes which are participating in the spanning tree configuration, use the following formula to determine the proper setting for the spanning tree maximum age timer (**stmaxage**): 2N + 6, where N equals the number of nodes.

For example, if the network consists of 16 nodes, then the **stmaxage** timer should be set to 38 seconds: 2 x (16) + 6= 38.

24 Repeat all the assignments in this procedure at each Ethernet node in the network.

END OF STEPS

Figure 11-8 SONET layer BLSR protected Ethernet packet ring on a BLSR without NUT



Basic provisioning at all nodes (LNW70):
VLAN Tagging Mode=SWITCHED (LNW70)
Cross Connect Mode=STS1 (LNW70)
Ed-eqpt:tid:fn-d-1:ctag::ETHPK:vlantagmd=switched,eccmode=sts1

Virtual Switch ID = 123
Virtual LAN Tagging Mode=Transparent or 802.1TAG
Ethernet (LAN) Ports: d1-1, d1-2
VCG (WAN) Ports: d1-v1, d1-v3

Cross-connections: See examples in figure above

Spanning Tree Group ID (for example, 1)
VCG (WAN) Ports: d1-v1, d1-v3

Basic provisioning at all nodes (LNW67/68):
VLAN Tagging Mode = 802.1TAG or Transparent

Virtual Switch ID (for example, 123)
Ethernet (LAN) Ports: d1-1, d1-2
VCG (WAN) Ports: d1-v1, d1-v3

Cross-connections: See examples in figure above

Spanning Tree Group ID (for example, 1)
VCG (WAN) Ports: d1-v1, d1-v3

NC-DMX-233-2

Procedure 11-9: Establish 802.1q mode Ethernet service on established packet ring (BLSR protected)

Overview

This procedure provides an example for configuring Ethernet service using the 802.1q tagging mode on an established packet ring on a BLSR. See Figure 11-9, "Example service on BLSR using 802.1q tagging mode" (p. 11-65) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! The packet ring must already be established on the BLSR before continuing. This procedure assumes the packet ring is established with the necessary tagging modes, virtual switch IDs, cross-connections, and spanning tree groups established. See Procedure 11-8: "Establish Ethernet packet ring on a BLSR without NUT" (p. 11-53).

On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (802.1q) and virtual switch ID.
- The VLAN IDs being assigned.

Steps

Use this procedure as an example for configuring 802.1q tagging mode Ethernet service on an established packet ring in a BLSR ring.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** to retrieve a node-to-node listing of every node in the network.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Routing Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, virtual switch ID, WAN (VCG) ports, and VLAN IDs associated with the service being established.

5 

NOTICE

Service-disruption hazard

After the VLAN ID for customer untagged frames is assigned and service is established in the 802.1q mode, changing the VLAN ID may affect service. If the VLAN IDs are different, service will be affected.

When the VLAN ID for customer untagged frames is changed at one point in the network, the VLAN ID must be changed at all points.

ASSIGN VLAN IDs TO ESTABLISH SERVICE

Use the TL1 **ent-vlan** command to assign the default VLAN ID for customer untagged frames and/or the customer VLAN ID for tagged frames to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. For example, see Figure 11-9, "Example service on BLSR using 802.1q tagging mode" (p. 11-65).

Important! When configuring a multiple point service in 802.1q mode, if spanning tree BPDUs from a customer are to be transported across the network, then the same default VLAN must be assigned to all ports associated with the service.

Reference: In Figure 11-9, "Example service on BLSR using 802.1q tagging mode" (p. 11-65), assume a GbE circuit pack is installed in Function slot d-1, LAN port 1 at each circuit pack is used for service, and the packet ring has already been established.

Note that a service has been established between Node D and Node A for customer untagged frames using a default VLAN ID of 34.

Note that a service has been established among Node C, Node B, and Node A for customer tagged frames using a VLAN ID of 55.

6 PROVISION LAN PORTS

Use the TL1 **ed-eport** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

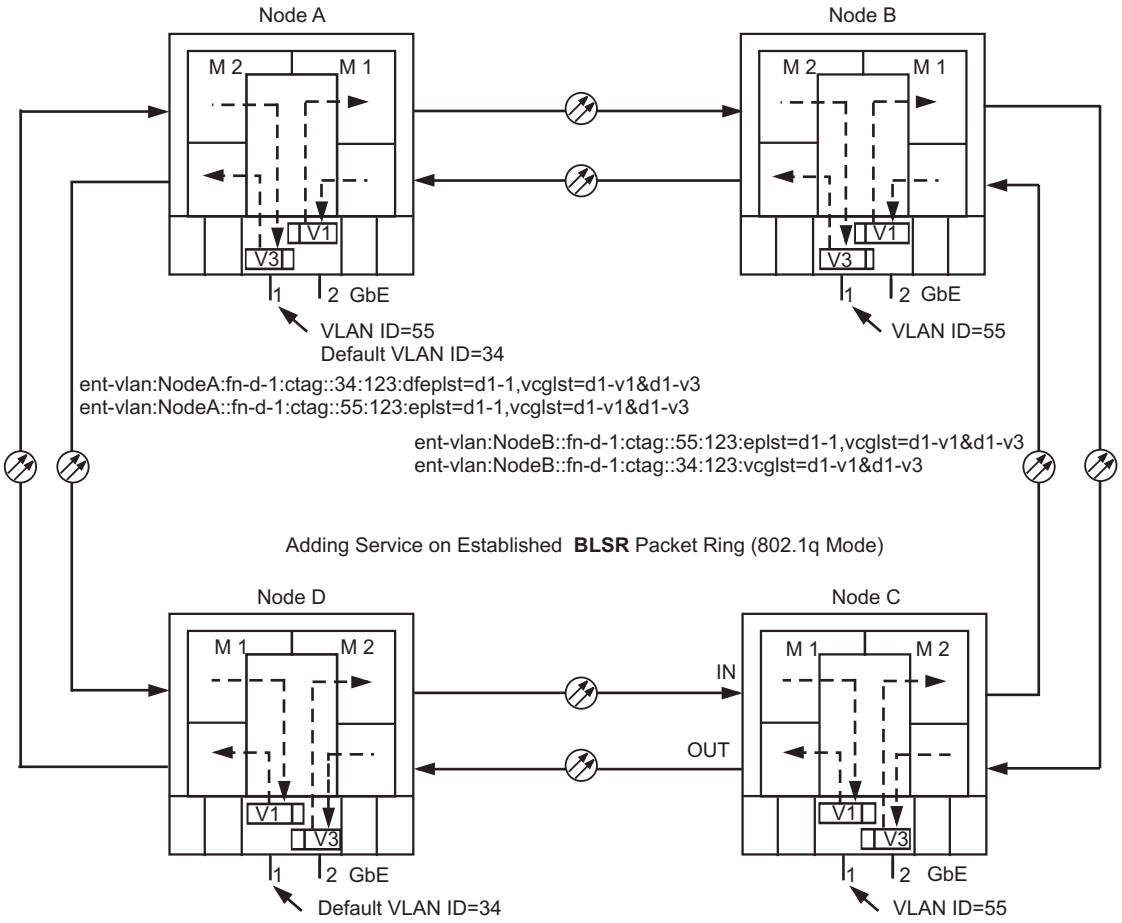
7 PROVISION VCGS

Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-9 Example service on BLSR using 802.1q tagging mode



Procedure 11-10: Establish transparent mode Ethernet service on established packet ring (BLSR protected)

Overview

This procedure provides an example for configuring Ethernet service using the Transparent tagging mode on an established packet ring on a BLSR. See Figure 11-10, "Example service on BLSR using transparent tagging mode" (p. 11-69) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! The packet ring must already be established on the BLSR before continuing. This procedure assumes the packet ring is established with the necessary tagging modes, virtual switch IDs, cross-connections, and spanning tree groups established. See Procedure 11-8: "Establish Ethernet packet ring on a BLSR without NUT" (p. 11-53).

On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (Transparent) and virtual switch ID.
- The Port Tags being assigned.

Steps

Use this procedure as an example for configuring Transparent tagging mode Ethernet service on a BLSR.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** to retrieve a node-to-node listing of every node in the network.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Routing Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, virtual switch ID, WAN (VCG) ports, and VLAN IDs associated with the service being established.

5 CREATE PORT TAGs

Use the TL1 **`ed-eport`** and **`ed-vcg`** commands to assign port tags to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create Port Tag** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.

Important! The Peak Information Rate (PIR) rate limiting feature on the LNW66/LNW67/LNW68 circuit packs will not be effective in transparent mode if the Ethernet Type (ethertype) parameter for the LAN or WAN VCG ports is provisioned to any value other than FFFF or 8100.

6 PROVISION LAN (Ethernet) PORTS

Use the TL1 **`ed-eport`** command to provision parameters for the LAN port being provisioned. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit or continue with the next step.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

7 PROVISION WAN (VCG) PORTS

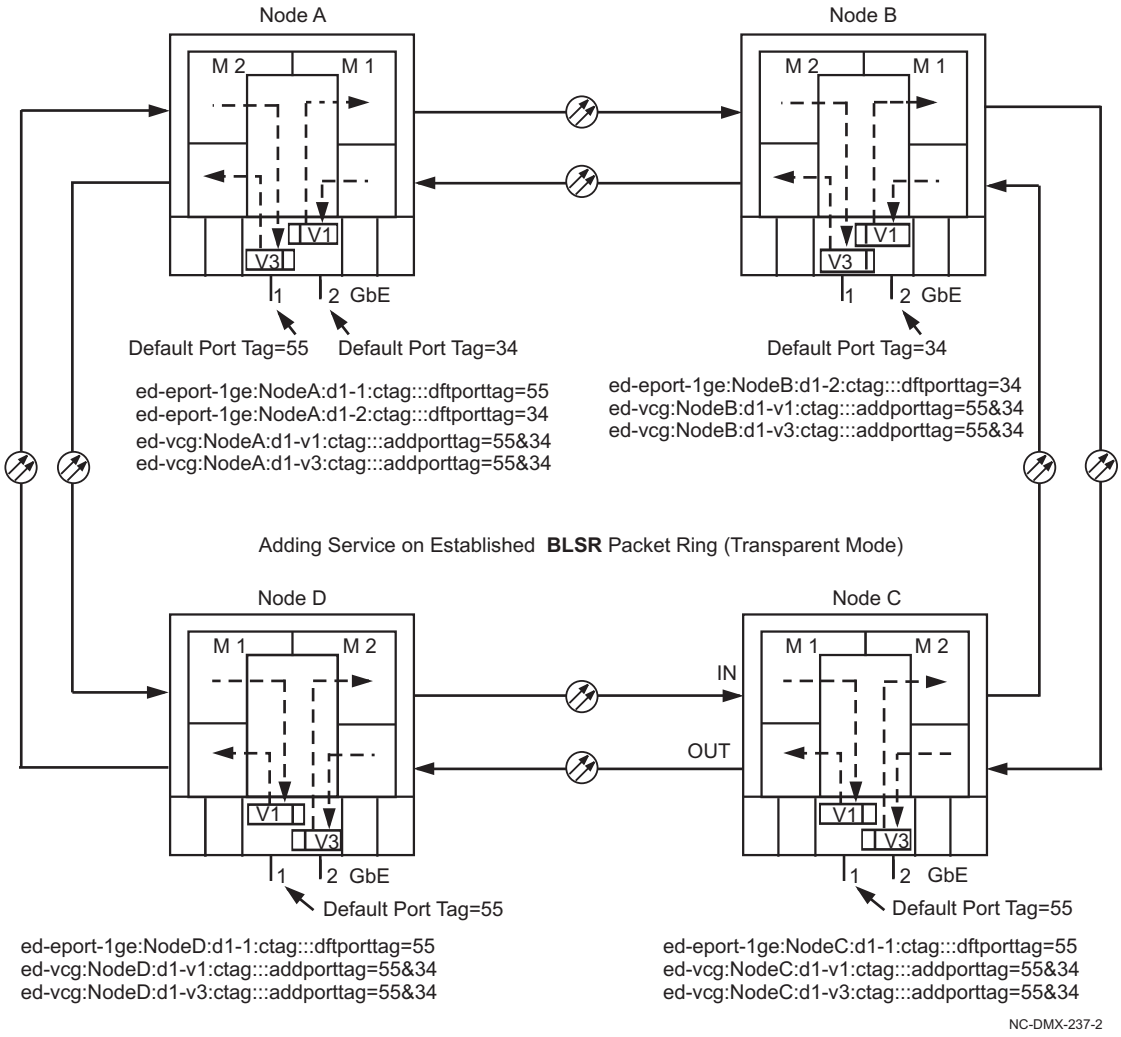
Use the TL1 **`ed-vcg`** command to provision parameters for the VCG ports, as required. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-10 Example service on BLSR using transparent tagging mode



Procedure 11-11: Provision Ethernet LAN port parameters

Overview

This procedure provides a list of provisionable parameters for Ethernet LAN ports.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisionable LAN eport parameters.

1 Use the **`ed-eport`** TL1 command or select **Configuration** → **Equipment** from the System View menu for the majority of parameters. Expand the details for the circuit pack, select (highlight) the LAN Port, then click **Select**.

Result: Exceptions to provisioning parameters from the **Configuration** → **Equipment** command will be noted in this procedure.

Reference: Appendix A, "Provisionable parameters"

2 Use Table 11-1, "ED-EPORT command provisionable parameters" (p. 11-71) as reference to provision the necessary LAN port parameters from your work instructions.

Important! Some of the parameters may have already been provisioned from earlier procedures for establishing service or packet rings.

END OF STEPS

ED-EPORT command parameters

Table 11-1, "ED-EPORT command provisionable parameters" (p. 11-71) lists the provisionable parameters for the **`ed-eport`** command:

Table 11-1 ED-EPORT command provisionable parameters

Parameter	Description
dplxmd	**Provisioned Duplex Mode** may have one of the following values: • Half • Full • Auto (initial value) Duplex Mode applies only to LNW66 10/100T Fast Ethernet ports.
epmode	Ethernet **Port Monitoring Mode** may have one of the following values: • Auto (initial value) - The port automatically transitions to the in-service state upon detection on the port of a valid input. • NMON (not monitored) • IS (In Service)
eppm	**Data Port PM Enable**. Use the **Performance** → **Prov PM Settings** command from the System View menu to set this performance monitoring parameter to one of the following values: • Enable (initial value) • Disable This parameter controls whether Ethernet performance monitoring is enabled or disabled for the specified Ethernet port.
tcamd	**TCA Monitoring Mode**. This parameter specifies whether performance monitoring Threshold Crossing Alert reporting is enabled or disabled for the port. Use the **Performance** → **Prov PM Settings** command from the System View menu to set this performance monitoring parameter to one of the following values: • Enable • Disable (initial value) TCA reporting will not begin until *tcamd* is enabled and port monitoring mode is enabled (*eppm* = Enabled), and the port is in service (*epmode* = IS). **tcamd** does not apply to LNW78.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
fcmd	**Flow Control Mode** may have one of the following values: • Enable (Enable Transmit & Receive) • Disable (Disable Transmit & Receive) • AUTO - autonegotiate (initial value) • Drop - Disable end-to-end flow-control Transmit & Receive ENABLE and DISABLE only control Network-element controlled (local) flow-control. Both ENABLE and DISABLE still allow Customer Equipment controlled end-to-end flow-control. Initial value is ENABLE. DROP applies only to the LNW63, LNW64, LNW70/LNW170, LNW74, and LNW87. DROP both disables Network-element controlled flow-control and drops end-to-end flow-control messages. AUTO does not apply to optical FE ports (ports 17-24) on the LNW74, to optical ports on LNW70/LNW170, or to FE electrical PTM ports. Initial value is ENABLE. **fcmd** does not apply to the LNW78.
lnrate	**Line Rate**. Port **Provisioned Line Rate** for 10/100T Fast Ethernet (FE) and 10/100-PL Private Line Ports, may be assigned one of the following values: • 10M (sets the port as a 10 Mbs port) • 100M (sets the port as a 100 Mbs port) • AUTO (initial value [auto negotiates the port rate]) Parameter ONLY applies to FE ports on LNW66, LNW71, and LNW74 (electrical only) circuit packs. **Line Rate** for the LNW87 FE/GBE-PL. This parameter is used to provision the expected type of PTM (SFP) for multi-rate data packs that support per-port provisioning, subject to the following constraints: • lnrate may not be changed for ports that have cross-connections or loopbacks. • lnrate may not be changed for ports with admin=ENABLE. • lnrate may not be changed if any other parameters are included in the request, and the command modifier must match lnrate. **Line Rate** has the following values for the LNW87: • GX mode: For the LNW87, sets the port to operate with optical GbE PTMs. • GT mode: For the LNW87, sets the port to operate with electrical GbE PTMs. • FT mode: For the LNW87, sets the port to operate with electrical FE PTMs. • FX mode: For the LNW87, sets the port to operate with optical FE PTMs.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
autoneg	**Auto-Negotiation** may have one of the following values: • ENABLE - Enables autonegotiation (initial value) • DISABLE - Disables autonegotiation When autonegotiation is Disabled, if any of fcmd, lnrate, mdix or dplxmd parameters are set to AUTO, the NE maintains previously resolved operational states. If a state is unresolved, the following settings take effect: • *fcmd* = ENABLE • *lnrate* = 100M • *dplxmd* = FULL • *mdix* = MDI This parameter does not apply to optical Fast Ethernet (FE) ports; ports 5-8 on the LNW70/LNW170 circuit pack or ports 17-24 on the LNW74 circuit pack. This parameter does not apply to Electrical PTM GbE/FE ports. This parameter does not apply to LNW78.
dftporttag	**Default Port Tag** (Default Vlan ID) from the **Configuration** → **Data** → **Create Port Tag** command is an integer in the range "1-4093", or "0". A "0" means that the user does not want a default value to be set. This parameter is valid only in TRANSPARENT mode and after the port is already assigned as a member of a Virtual Switch (VRTSW). The *dftporttag* value cannot be on or be provisioned in the active composite list of Port Tag identifiers added by the addporttag. This parameter does not apply to the LNW71 10/100-PL Private Line ports, the LNW74 10/100 T/F Fast Ethernet ports, the LNW63/LNW64 GBE PL Gigabit Ethernet Private Line ports, or the LNW87 FE/GBE PL ports. For LNW70/LNW170 and LNW78 packs only, **dftporttag** values can be provisioned in another virtual switch. A default porttag cannot be entered if porttype is INTERIOR or if portrole is NETWORK

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
dftpri	**Port Default Priority** Legal values for LNW66, LNW67, and LNW68 ports are • High • Low • Not Applicable (initial value) A high priority gives a port a higher priority for service than another port. On the LNW70/LNW170, this parameter is used to provision the default CoS. This parameter is only valid if the selected port is part of a virtual switch and the vlantagmd of the circuit pack is SWITCHED and the porttype is BOUNDARY. The allowed values for dftpri are integers in the range 0 to 3 and NA. Value 3 is the highest priority and 0 (initial value) the lowest. This parameter is not valid if trafmgmtmd is set to TAGPORT or COSTAGPORT. This parameter is also ignored if trafmgmtmd is set to PORT and hlayercos is set to DSCP. On the LNW78, this parameter is the provisioned default CoS having effect only if trafmgmtmd is PORT or COSPORT. The allowed values for dftpri are integers in the range 1 (Class C - lowest priority) to 3 (Class A - highest value). 1 is the initial value. Changing dftpri is only possible when all QoS services created on this port are deleted. In this scenario, traffic is not interrupted but is metered until the new QoS services are created for the new dftpri. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, or LNW87 ports.
tagfilter	**Tag Filter**. This parameter is used to enable/disable VLAN/Port Tag filtering and may be one of the following: • ENABLE (initial value): allows only provisioned VLANs/port tags on a port. • DISABLE: allows all VLANs/port tags on a port. Tag Filter does not prevent creating, modifying, or deleting VLANs. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, or LNW87 Ethernet ports.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
bcratelimit	Broadcast and Multicast rate limit. This is the data rate limit, in Mbps, for incoming packets whose destination address is the broadcast address (FF-FF-FF-FF-FF-FF). It also includes all multicast addresses (XO-XX-XX-XX-XX-XX where "O" is an odd hexadecimal digit) including Bridge Filtered MAC group addresses used by PAUSE frames, BPDUs, Link Aggregation, etc. It also limits incoming packets whose destination address has not been learned (and therefore are broadcasted). This limit applies to the aggregate of all traffic at a port. While broadcast rate limiting is always enabled at a port, setting the limit greater than or equal to the port speed has the effect of no rate limiting. Valid value for the LNW70/LNW170 is an integer between 0 and 4000000, representing Kbps. Valid value for the LNW78 is an integer between 0 and 1000000, representing Kbps. A value of 0 (initial value) disables broadcast rate limiting. This parameter is valid for LNW70/LNW170 and LNW78 circuit pack LAN ports only if the selected port is part of a virtual switch and the VLAN Tagging Mode of the circuit pack is set to *Switched*.
stpp	**Spanning Tree Port Priority (0-255)**. Values range from 0 to 255. The initial value is 128. This parameter not valid in NOTAG mode. This parameter applies only to the LNW70/LNW170.
stpcost	**Spanning Tree Path Cost (0-65535)**. Value is an integer in the range from 1 to 65535. The initial value is 65535. This parameter not valid in NOTAG mode. This parameter applies only to the LNW70/LNW170.
sthellotm	**Spanning Tree Hello Timer (1-10 secs.)**. Value is an integer in the range from 1 to 10 seconds. The initial value is 2 seconds. This parameter not valid in NOTAG mode. This parameter applies only to the LNW70/LNW170.
epss	**Port Spanning Tree Status**. Values: • ENABLE (Initial value) - Enables Ethernet port for spanning tree. • DISABLE - Disables Ethernet port for spanning tree. When enabling the Ethernet port for spanning tree, the retrieved spanning tree status could be BLOCKED, DISCARDING or some other status value, depending on the state of the spanning tree; ENABLE is not a retrieved value. This parameter not valid in NOTAG mode. This parameter applies only to the LNW70/LNW170.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
stvid	**Spanning Tree VLAN ID (0 - 4095)**. Values: • An integer in the range 0 to 4095. The value 0 means no VLAN tag. Initial value is 0. This parameter not valid in NOTAG mode. This parameter applies only to the LNW70/LNW170.
ethfcs	**Ethernet Frame Check Sequence** (FCS). Controls whether to drop errored frames due to FCS or let them pass. Regardless of this setting, errored frames are always counted in the EFCRC counter. Values: • ENABLE (Initial value) - Drop errored frames. • DISABLE - Pass errored frames. This parameter applies only to the LNW63, LNW64 and LNW87.
admin	**Port Administration Control**. This parameter is used to enable/disable a port. It will enable/disable all frames to and from a port. Values: • ENABLE - Enables frames to/from port. • DISABLE - Disables frames to/from port.
addporttag	**Port Tag** identifiers, from the **Configuration** → **Data** → **Create Port Tag** command, to be added. Values: An integer in the range 1 to 4,093. The *addporttag* value cannot be the same as a value provisioned for the *dftporttag* parameter. Except for the LNW70/LNW170 and LNW78 circuit packs, this parameter is valid only in Transparent (TRANS) mode and may not be a value in another Virtual Switch. For the LNW70/LNW170 and LNW78 circuit packs, this parameter is valid when vlantagmd is set to SWITCHED and the port belongs to a virtual switch with tagmd set to Transparent. Values can also be provisioned in another virtual switch. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, or LNW87 , Ethernet ports.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
delporttag	List of **Port Tag** identifiers to be deleted. Values: An integer in the range 1 to 4,093. The initial status of this list is empty. The *addporttag* or *delporttag* parameter can be provisioned by this command but not both. They must be provisioned by separate command instances. This parameter is valid when *vlantagmd* is set to TRANS or when *vlantagmd* is set to SWITCHED. and the port belongs to a virtual switch with *tagmd* set to TRANS. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, or LNW87.
rcf	**Remote Client Fail**. This parameter enables/disables Remote Client Fail message detection and generation. Values: • ENABLE - Enables Remote Client Fail message • DISABLE - Disables Remote Client Fail message (Initial value) This parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74 and LNW87 circuit packs when VLAN Tagging Mode (vlantagmd) is set to *NOTAG*. This parameter must be enabled at both ends of the circuit in order to function.
rcf-linkdown	**Remote Client Fail Link Shutdown**. When rcf is enabled, this parameter controls link shutdown by Remote Client Fail message reception. Values: • ENABLE - Enables link shutdown (Initial Value) • DISABLE - Disables link shutdown. This parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74 and LNW87 circuit packs when VLAN Tagging Mode (vlantagmd) is set to *NOTAG*. Link Loss Return (LLR) is a feature on some external equipment. External equipment with LLR enabled will stop sending link pulses back to the LNW63/64/70/74 if the LNW63/64/70/74 has stopped transmitting link pulses to the external equipment due to a link shutdown performed by the Remote Client Fail Link Shutdown feature. Therefore, when the LNW63/64/70/74 is connected to equipment that has the Link Loss Return feature enabled, the Remote Client Fail Link Shutdown (rcf-linkdown) option should be disabled to avoid a link shutdown locking problem. Customers planning to use the CSF feature with RCF-Linkdown enabled should disable LLR on the external equipment.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
rcf_rdi	**Remote Client Fail Reverse Defect Indication**. This parameter is used to enable/disable the reverse direction of two-way Auto Link Shutdown (ALS) using GFP RDI control frames and may have one of the following values: • ENABLE — Enable Two-way (ALS) Auto Link Shutdown (Initial Value). • DISABLE This parameter applies to both FE and GE interfaces on the LNW63, LNW64, LNW70, LNW74, LNW87, and LNW170. This parameter is significant when both **Remote Client Fail** and **Remote Client Fail Link Shutdown** are enabled.
rcf_ldhotmr	**Remote Client Fail Link Down Hold-off Timer.** Only in effect when rcf_linkdown is enabled and the link shutdown was due to VCG failure (inc. VCG failed). It specifies the delay time between the declaration of sink client signal fail defect, and the link shutdown along with the generation of the ALS (auto link shutdown) alarm. Values: • An integer in the range of 0 to 10000 milliseconds (10 seconds), in 100 millisecond steps. • Infinity (TL1: 99,999 msec) The default value is 200 msec. This parameter applies to the LNW70, LNW170, LNW74, LNW63, LNW64, LNW87.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
fefi_det	**Far End Fault Indication Detection**. Different responses to FEFI are available according to the following values: • LAN — The LAN component of FEFI detection behavior is enabled. • LAN_RCF — Both the LAN and RCF components of FEFI detection behavior are enabled. • RCF — The RCF component of FEFI detection behavior is enabled. • DISABLE — FEFI detection disabled (Initial Value). For values that include the LAN component: When FEFI is detected at the receiver, a LAN FERF (FEFI) alarm may be generated and, if link_good = DISABLE, idle codes are sent by the transmitter. For values that include the RCF component: When FEFI is detected at the receiver, if rcf = ENABLE, a Remote Client Fail message, using the RTRV-EQPT fefi_code, is sent to the WAN. If rcf = ENABLE, and a Remote Client Fail message having the RTRV-EQPT fefi_code is received from the WAN, a GFP_RCF alarm may be generated for the associated VCG. This parameter applies to optical FE ports on the LNW74, LNW70/170, and LNW87. When vlantagmd is set to SWITCHED, only values LAN and DISABLE are valid. Does not apply to a LAG. It does apply to a member por t of a LAG.
fefi_gen	**Far End Fault Indication Generation**. Different FEFI generation codes are available according to the following values: • LAN — The LAN component of FEFI generation behavior is enabled. • LAN_RCF — Both the LAN and RCF components of FEFI generation behavior are enabled. • RCF — The RCF component of FEFI generation behavior is enabled. • DISABLE — FEFI generation disabled (Initial Value). For values that include the LAN component, when a fault is detected at the receiver, FEFI is sent by the transmitter. For values that include the RCF component: If rcf = ENABLE and rcf_linkdown = ENABLE, and a Remote Client Fail message having the RTRV-EQPT fefi_code is received from the WAN, FEFI is sent by the transmitter. This parameter applies to optical FE ports on the LNW74, LNW70/170, and LNW87. When vlantagmd is set to SWITCHED, only values LAN and DISABLE are valid. Does not apply to a LAG. It does apply to a member por t of a LAG.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
link_good	**Link Good**. When link_good is enabled, the port transmitter does not insert idles in response to faults or FEFI detected at the receiver. Because FEFI may still be inserted in place of transmitted data when fefi_gen = LAN, LAN_RCF, or RCF, to assure that data can pass regardless of the state of the receiver, fefi_gen must be disabled. Values: • ENABLE — Enable link_good. • DISABLE — Disable link_good (Initial Value). This parameter applies to optical FE ports on the LNW74, LNW70/170, and LNW87. Does not apply to a LAG. It does apply to a member por t of a LAG.
jumbo	**JUMBO Frame Support**. This parameter specifies whether JUMBO frames of up to 10240 bytes are supported on the port, addressed by the aid. Disabling JUMBO support improves latency for sub-rate services and drops JUMBO size frames. Values: • ENABLE (Initial Value) • DISABLE This parameter applies only to the LNW71 circuit pack. **Note:** The LNW66, LNW67 and LNW68 do not have a setting for maximum frame size. For these packs, the maximum size of the frame is the same as for the LNW71 when jumbo is DISABLE (1536 bytes maximum including MAC DA through MAC FCS inclusive). **Note:** Other circuit packs do not use the jumbo parameter (see mtu_size).
mtu_size	The MTU size parameter specifies the Maximum Transmission Unit (MTU) size (in bytes) supported on the port. The MTU size is the size of the payload in the Ethernet frame, excluding Source and Destination Address, Type and CRC field, but including all VLAN tags. Any VLAN on the frames or added to the frame by the system will effectively reduce the maximum MTU size. This parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74, LNW78 and LNW87 circuit packs. • For LNW63/64/70/78 ports, the valid value is an integer in the range 46 to 10222 (default is 1508). • For LNW74 ports, the valid value is an integer in the range 1500 to 9614 (default is 1508).

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
emsdt	**Exceeded MTU Size Drop Threshold**. This parameter specifies the point at which an alarm is generated when the ratio (Exceeded MTU size drop count / Total frame received count) surpasses the set threshold. Value: an integer in the range 0 (feature disabled) to 1000 (100%), in steps of 1 (0.1%). The initial value is 0 (feature is disabled). "Feature disabled" indicates that the "exceeded MTU size drop" (emsd) alarm is NOT generated when the threshold is surpassed. This parameter applies to the LNW64, LNW70/LNW170, LNW74, and LNW87 circuit packs.
mdix	**Crossover Mode**. This parameter sets the crossover mode for the port. Values: • Auto (Initial default): The system determines if crossover is needed, then automatically sets the port to AUTOMDIX or AUTOMDI mode. • MDIX: RJ-45 TXP/TXN pins are transmit RJ-45 RXP/RXN pins are receive • MDI: RJ-45 TXP/TXN pins are receive RJ-45 RXP/RXN pins are transmit This parameter does not apply to the LNW66/67/68 circuit packs or to optical ports. For the LNW74 circuit pack, when autoneg is set to DISABLE, mdix is automatically set to MDIX. The mdix parameter applies to electrical SPF (GbE/FE) ports.
ethertype	**Ethernet Type** field (TPID). Used to interwork with other vendors' equipment using stacked VLAN. This parameter is only valid when the VLAN Tagging Mode of the circuit pack is *Transparent*. For the LNW70/LNW170/LNW78 circuit packs, this parameter is only valid if the selected port on the pack is part of a virtual switch (the VLAN Tagging Mode of the virtual switch must be *Transparent*) and the VLAN Tagging Mode of the circuit pack is *Switched*. Values: • A string in the range "0601" to "FFFF". • The default value is "FFFF" (hexadecimal).

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
porttype	**Port Type**. Specifies whether the port is at the boundary of the DiffServ domain or is a port interior to the DiffServ domain. Used in provisioning QoS services. Valid values are • Boundary (Initial value) • Interior This parameter applies only to the LNW70/LNW170 and LNW78 circuit pack ports, when the port is part of a virtual switch, and vlantagmd is SWITCHED. For the LNW78 the only allowed value is Boundary.
portrole	**Port Role**. Port Role controls how tags are added/removed/processed. In typical applications, “boundary” ports are “customer” ports and “interior” ports are “network” ports. Port role has the following values: Valid values are • Customer (Initial value): The port carries packets, typically from one customer, for one or more rate-controlled services. The port may have a default VLAN ID or default port tag. Customer ports are normally configured as boundary ports. • Network: The port carries packets typically from multiple customers. Port must not have a default VLAN ID or a default port tag. Network ports are typically configured as interior ports, but may also be boundary ports in some network configurations. This parameter applies only to the LNW70/LNW170 and LNW78 circuit pack ports, when the port is part of a virtual switch, and vlantagmd is SWITCHED. For the LNW78, the only allowed value is Customer.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
trafmgmtmd	**Traffic Management Mode**. Specifies how the packets will be divided into traffic flows and the services that can be provided at the port. Values are: • NOTC: This mode is valid for ports with porttype BOUNDARY only in TRANS and 802.1Q tagmd. It is also valid for Private Line ports. There is no traffic conditioning of packets that are received at the port. This mode allows interworking with LNW66/67/68. • PORT (Initial value): This mode is valid for ports with porttype BOUNDARY only in TRANS and 802.1Q tagmd (see ENT-VRTSW). It is also valid for Private Line ports. All traffic received at the port is processed by a single traffic conditioner. The user_priority bits are remarked with the dftpri and the drop precedence determined from the traffic conditioner according to the provisioned mapping (see ED-ERATE). When the hlayercos parameter is set to DSCP, All traffic received at the port with the same Differentiated Services Code Point (DSCP) is processed by a single traffic conditioner for the CoS that is provisioned for that DSCP (see dscp2cos). There can be one service for each provisioned CoS (up to 4) at the port. The user_priority (L2) bits are remarked with the CoS and the drop precedence, which was determined from the traffic conditioner, according to the provisioned dscp2cos mapping. When hlayercos is set to NONE, all traffic received at the port is processed by a single traffic conditioner. The user priority bits are remarked with the dftpri and the drop precedence determined from the traffic conditioner according to the provisioned mapping.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
	• COSPORT: This mode is valid for ports with porttype BOUNDARY only in TRANS and 802.1Q tagmd. All traffic received at the port that is tagged with the same 802.1p user priority is processed by a single traffic conditioner for the CoS that is provisioned for that user priority (see userpri2cos in ED-ERATE). The CoS level for untagged traffic is set to the default priority (dftpri) or 0 if dftpri is NA. There can be one service for each provisioned CoS (up to 4) at the port. The stacked/outermost TAG user_priority bits are marked with the CoS and the drop precedence, which was determined from the traffic conditioner, according to the provisioned user priority mapping (see ED-ERATE). But the customer VLAN TAG user_priority bits are untouched and preserved. The COSPORT traffic management mode in TRANS tagmd applies only to the LNW70/LNW170 circuit pack. • TAGPORT: This mode is valid for ports with porttype BOUNDARY only in 802.1Q tagmd. All traffic received at the port that is tagged with the same VLANid is processed by a single traffic conditioner. The user priority bits are remarked with the dftpri2cos (see ED-ERATE) and the drop precedence determined from the traffic conditioner according to the provisioned mapping (see ED-ERATE). • COSTAGPORT: This mode is valid for ports with porttype BOUNDARY only in 802.1Q tagmd. All traffic received at the port that is tagged with the same VLANid and the same CoS is processed by a single traffic conditioner for the VLANid and that CoS. There can be one service for each provisioned CoS (up to 4) on each provisioned VLANid at the port. The user priority bits are remarked with the CoS and the drop precedence, which was determined from the traffic conditioner, according to the provisioned user priority mapping (see ED-ERATE). Setting trafmgmtmd to TAGPORT or COSTAGPORT is not allowed when tagfilter is DISABLE. For the same reason, it is not allowed to set tagfilter to DISABLE when trafmgmtmd is TAGPORT or COSTAGPORT. This parameter applies to the LNW70/LNW170 and LNW78 circuit pack but for the LNW78 the only values are PORT and COSPORT.
qwt_ntwkAF	**Network Port AF Queue Weighting Factor (WF)**. Specifies the weighting factor used by the queue service algorithm for the AF queue for packets coming from network ports. (Whether a port is a customer or network port is determined by the portrole parameter.) Valid value is an integer between 1 and 100 (highest weight). Default is 64. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
qwt_custAF	**Customer Port AF Queue Weighting Factor (WF)**. Specifies the weighting factor used by the queue service algorithm for the AF queue for packets coming from customer ports. (Whether a port is a customer or network port is determined by the portrole parameter.) Valid value is an integer between 1 and 100 (highest weight). Default is 36. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170.
qsz	**Total Queue Size**. Specifies the total queue size for the port, including the EF and AF queues as well as the management queues. Beginning in Release 9.1, ports on the LNW63 and LNW74 support the following values for total queue size: • NA (default) Not Applicable. The ingress queue size is automatically set as a function of mtu_size and fcmd, consistent with releases prior to Release 9.1 • 128 The ingress queue size is 128 Kbytes. This value is supported for FE ports only. • 512 The ingress queue size is 512 Kbytes. This value is supported for GE ports only. Ports on the LNW70/LNW170 and the LNW78 support the queue size parameter. If the port is part of a virtual switch and the VLAN Tagging Mode (vlantagmd) is set to SWITCHED, valid value is an integer between 0 and 256 Kbytes (default is 256 Kbytes). The value cannot be greater than the maximum supported frame size. Refer to the MTU Size parameter.
qminthldy	**Yellow Packet Minimum (Min) Drop Threshold**. Specifies the minimum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 99 (default is 33). Value must be less than the Yellow Max Drop Threshold. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
qmaxthldy	**Yellow Maximum (Max) Drop Threshold**. Specifies the maximum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 100 (default is 50). Value must be greater than the Yellow Min Drop Threshold and less than or equal to the Green Min Drop Threshold This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.
qminthldg	**Green Minimum (Min) Drop Threshold**. Specifies the minimum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 100 (default is 90). Value must be greater than or equal to the Yellow Max Drop Threshold. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.
qdropwt0	**CoS 0 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 0 packets used by the drop algorithm. Valid value is an integer between 0 and 100% (default value is 100%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170.
qdropwt1	**CoS 1 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 1 packets used by the drop algorithm. Valid value is an integer between 0 and 100% (default value is 100%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.
qdropwt2	**CoS 2 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 2 packets used by the drop algorithm. Valid value is an integer between 0 and 100% (default value is 100%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
qdropwt3	**CoS 3 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 3 packets used by the drop algorithm. Valid value is an integer value between 0 and 100% (default value is 50%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.
hlayercos	**Higher Layer Class of Service (CoS)** . This parameter determines whether the packets are classified by a higher level protocol, such as Diffserv Code Point (DSCP) in the IP header. Values are: • NONE: Higher layer is not used for classification (default). • DSCP: Higher layer DSCP bits in the IP header are used for classification. Notes: Higher layer classification is supported only when **trafmgmtmd** is set to **PORT**. **hlayercos** is ignored in other **trafmgmtmd** modes. **hlayercos** parameter applies only to the LNW70/LNW170.
locked_sa	**Locked Source Address**. This parameter controls whether the virtual switch restricts admission of packets, with source addresses matching ENT-MAC entries with type=PERSISTENT, to this port, and only this port; and discards all others on this port. This parameter applies only if the port is part of a virtual switch when vlantagmd is SWITCHED [see ED-EQPT] and can be enabled only if there are no ENT-MAC entries with type=FILTERED. Valid values are • Enable (source addresses locked) • Disable (Initial value) This parameter applies only to the LNW70/LNW170 circuit pack.
aapslact	**Actor_Admin_Port_State_LACP_Activity**. This parameter specifies whether a participant in the aggregation group periodically transmits link aggregation control protocol data units (LACPDUs) to maintain the aggregate. If set to Active, the participant will periodically transmit LACPDUs. If set to Passive, a participant will respond only to received LACPDUs from an Active partner. Valid values are • Active (initial value) • Passive This parameter is valid only for a member of a LAG with lag group (lagrp) protocol set to LACP.

Table 11-1 ED-EPORT command provisionable parameters (continued)

Parameter	Description
aapsltimo	**Actor_Admin_Port_State_LACP_Timeout**. This parameter specifies the rate at which periodic transmissions of LACPDUs occur. Valid values are • Long (initial value): indicates periodic transmissions at a slow transmission rate. • Short: indicates periodic transmissions at a fast transmission rate. This parameter is valid only for a member of a LAG with lag group (lagrp) protocol set to LACP.
actppri	**Actor_Port_Priority**. Specifies the port priority for the member of a LAG. Value: an integer in the range 0 to 65535. The initial value is 32768. This parameter is valid only for a member of a LAG.

Procedure 11-12: Provision Ethernet VCG parameters

Overview

This procedure provides a list of provisionable parameters for virtual concatenation groups (VCGs).

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisioning VCG parameters.

1 Use the **ed-vcg** TL1 command or select **Configuration** → **Equipment** from the System View menu for the majority of parameters. Expand the details for the circuit pack, select (highlight) the VCG port, then click **Select**.

Result: Exceptions to provisioning parameters from the **Configuration** → **Equipment** command will be noted in this procedure.

Reference: Appendix A, "Provisionable parameters"

2 Use Table 11-2, "ED-VCG command provisionable parameters" (p. 11-90) as reference to provision the necessary parameters from your work instructions.

Important! Some of the parameters may have already been provisioned from earlier procedures for establishing service or packet rings. For an RPR circuit pack (LNW78) the only valid VCGs are Ethernet over SONET VCGs. For RPR VCGs see ED-VCG-RPR.

END OF STEPS

ED-VCG command parameters

Table 11-2, "ED-VCG command provisionable parameters" (p. 11-90) lists the provisionable parameters for the ed-vcg command:

Table 11-2 ED-VCG command provisionable parameters

Parameter	Description
stpp	**Spanning Tree Port Priority (0-255)**. Values range from 0 to 255. The initial value is 128. This parameter not valid in NOTAG mode. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87, or LNW78 ports.
stpcost	**Spanning Tree Path Cost (0-65535)**. Value is an integer in the range from 1 to 65535. The initial value is 10. This parameter not valid in NOTAG mode. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87, or LNW78 ports.
sthellotm	**Spanning Tree Hello Timer (1-10 secs.)**. Value is an integer in the range from 1 to 10 seconds. The initial value is 2 seconds. This parameter not valid in NOTAG mode. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87, or LNW78 ports.
stvid	**Spanning Tree VLAN ID (0 - 4095)**. Values: • An integer in the range 0 to 4095. The value 0 means no VLAN tag. Initial value is 4095 This parameter not valid in NOTAG mode. This parameter applies only to the LNW70/LNW170.
vmode	**VCG Monitoring Mode** may have one of the following values: • AUTO - port automatically goes in-service (IS) when a valid input is received. • NMON (not monitored)

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
vss	**VCG Spanning Tree Status**. Values are as follows: • Enable (initial value): Enables VCG port for spanning tree • Disable: Disables VCG port for spanning tree When enabling the VCG port for Spanning Tree, the retrieved spanning tree status could be "blocked", "discarded", or some other status value depending on the state of the spanning tree. This parameter is not valid in NOTAG mode. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87, or LNW78 ports.
dftpri	**Port Default Priority** This is the (default) provisioned Class of Service (CoS). This is the CoS as it is encoded in the first 2 bits in the user_priority field of the VLAN tag. For the LNW70/LNW170, this parameter is used to provision the default CoS. It only pertains to ports with porttype BOUNDARY. The allowed values for dftpri are integers in the range 0 to 3 and NA. Value 3 is the highest priority and 0 (initial value) the lowest. For the LNW78, this parameter is used to provision the default CoS. It has effect only if trafmgmtmd is PORT or COSPORT. The allowed values are integers in the range 1 to 3. Value 3 is the highest priority (Class A) and 1 (Class C) the lowest. Initial value is 1. When trafmgmtmd is PORT, changing dftpri is only possible when all QoS services created on this port (using ENT-ERATE) have been deleted (using DLT-ERATE). Traffic will not be interrupted, but will be unmetered until a new QoS service has been created for the (new) dftpri. This parameter applies only to the LNW70/LNW170 and LNW78 circuit packs.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
addporttag	**Port Tag** identifiers, from the **Configuration** → **Data** → **Create Port Tag** command, to be added. Composite list of port tag identifiers to be added. Values are an ampersand (&) (TL1 command) or comma (,) (*WaveStar*® CIT) separated list of port tag identifiers. Port tag identifiers are integers in the range from 1 to 4093. The *addporttag* value cannot be the same as a value provisioned for the dftporttag parameter. Except for the LNW70/LNW170 and LNW78 circuit packs, this parameter is valid only in TRANS (transparent) mode and may not be a value in another Virtual Switch. For the LNW70/LNW170 and LNW78, the addporttag value may be provisioned in another virtual switch. For the LNW70/LNW170 and LNW78 circuit packs, this parameter is valid when the VLAN Tagging Mode (vlantagmd) is set to SWITCHED and the port belongs to a virtual switch with tagmd set to TRANS. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87 or LNW78 ports.
delporttag	List of **Port Tag** identifiers to be deleted. Values: An integer in the range 1 to 4,093. The initial status of this list is empty. The *addporttag* or *delporttag* parameters can be provisioned by this command but not both. They must be provisioned by separate command instances. This parameter is valid when *vlantagmd*is set to TRANS or when *vlantagmd*is set to SWITCHED and the port belongs to a virtual switch with *tagmd*set to TRANS. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87 or LNW78 ports.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
dftporttag	**Default Port Tag** (Default Vlan ID) from the **Configuration** → **Data** → **Create Port Tag** command is an integer in the range "1-4093", or "0". A "0" means that the user does not want a default value to be set. Except for the LNW70/LNW170 and LNW78 circuit packs, this parameter is valid only in TRANS (transparent) mode and may not be a value in another Virtual Switch. For the LNW70/LNW170 and LNW78, the dftporttag value may be provisioned in another virtual switch. For the LNW70/LNW170 and LNW78 circuit packs, this parameter is valid when the VLAN Tagging Mode (vlantagmd) is set to SWITCHED and the port belongs to a virtual switch with tagmd set to TRANS. The *dftporttag* value cannot be on or be provisioned in the active composite list of Port Tag identifiers added by the addporttag. A default porttag cannot be entered if porttype is INTERIOR or if portrole is NETWORK. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74 or LNW87 ports.
tagfilter	**Tag Filter**. This parameter is used to enable/disable VLAN/Port Tag filtering and may be one of the following: • ENABLE (initial value): allows only provisioned VLANs/port tags on a port. • DISABLE: allows all VLANs/port tags on a port. Tag Filter does not prevent creating, modifying, or deleting VLANs. This parameter does not apply to the LNW63, LNW64, LNW71, LNW74, LNW87 or LNW78 ports.
vpm	**VCG PM Enable**. This parameter controls when performance monitoring is enabled for the specified VCG. Use the **Performance** → **Prov PM Settings** command from the System View menu to set this performance monitoring parameter to one of the following values: • Enable (initial value) • Disable

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
psctl	**Pause Control**. Pause Control may have one of the following values: • TRANSPARENT (full rate end-to-end flow control) Enable Pause control pass-through Disable Pause control generation • LOCAL (initial value) (sub-rate local flow control) Disable Pause control pass-through Enable Pause control generation • NONE Disable Pause control pass-through Disable Pause control generation This parameter does not apply to the LNW63, LNW64, LNW70/LNW170, LNW71, LNW87 or LNW74 Ethernet ports.
ethertype	**Ethernet Type (in Hex.)** field (TPID). Used to interwork with other vendors' equipment using stacked VLAN. Values: • A string in the range "0601" to "FFFF". • The default value is "FFFF" (hexadecimal). Except for the LNW70/LNW170, this parameter is valid only when *vlantagmd* is set to TRANS (transparent) mode. For the LNW70/LNW170 circuit pack, this parameter is valid when the LNW70/LNW170 VLAN Tagging Mode (vlantagmd) is set to SWITCHED and the port belongs to a virtual switch with tagmd set to TRANS. When the Ethertype parameter is provisioned to any value other than FFFF or 8100, the PIR rate limiting feature on the LNW66/LNW67/LNW68 is not effective in transparent mode.
tcamd	**TCA Mode Enable**. This parameter specifies whether performance monitoring Threshold Crossing Alert reporting is enabled or disabled for the port, addressed by the aid. • Enabled • Disabled (initial value) TCA reporting will not begin until *tcamd* is enabled and port monitoring mode is enabled (*vpm* = ENABLE), and the port is in service (*vmode* = IS). This parameter does not apply to the LNW78 ports.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
mtu_size	The MTU size parameter specifies the Maximum Transmission Unit (MTU) size (in bytes) supported on the port. The MTU size is the size of the payload in the Ethernet frame, excluding Source and Destination Address, Type and CRC field, but including all VLAN tags. Any VLAN on the frames or added to the frame by the system will effectively reduce the maximum MTU size. This parameter applies only to the LNW70/LNW170 and LNW78 circuit packs. • The valid value is an integer in the range 46 to 10222 (default is 1508).
emsdt	**Exceeded MTU Size Drop Threshold**. This parameter specifies the point at which an alarm is generated when the ratio (Exceeded MTU size drop count / Total frame received count) surpasses the set threshold. Value: an integer in the range 0 (feature disabled) to 1000 (100%), in steps of 1 (0.1%). The initial value is 0 (feature is disabled). "Feature disabled" indicates that the "exceeded MTU size drop" (emsd) alarm is NOT generated when the threshold is surpassed. This parameter applies to the LNW70/LNW170 circuit packs.
gfp_fcs	**GFP Frame Check Sequence**. This parameter controls the handling of the GFP FCS field for the specified VCG. The valid values are • ENABLE • DISABLE Parameter is valid only for LNW63, LNW64, LNW70/LNW170, LNW74, LNW87 and LNW78 circuit packs. When interworking with equipment that does NOT support GFP FCS, the parameter should be set to DISABLE. On the LNW63 and LNW74 circuit packs, this parameter only controls the transmit of the GFP FCS. The GFP FCS on receipt will be handled depending on the presence or not of the GFP FCS field as indicated by the received PFI bit. If GFP FCS is present it will always be checked. On the LNW64, LNW70/LNW170, LNW87 and LNW78 circuit packs, this parameter controls both the transmit and receive of the GFP FCS. On receipt, the GFP FCS field will be checked for (and should be present) when gfp_fcs is ENABLED, and the GFP FCS will NOT be checked for (and should NOT be present) when gfp_fcs is DISABLED.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
bcratelimit	Broadcast and Multicast rate limit. This is the data rate limit, in Mbps, for incoming packets whose destination address is the broadcast address (FF-FF-FF-FF-FF-FF). It also includes all multicast addresses (XO-XX-XX-XX-XX-XX where "O" is an odd hexadecimal digit) including Bridge Filtered MAC group addresses used by PAUSE frames, BPDUs, Link Aggregation, etc. It also limits incoming packets whose destination address has not been learned (and therefore are broadcasted). This limit applies to the aggregate of all traffic at a port. While broadcast rate limiting is always enabled at a port, setting the limit greater than or equal to the port speed has the effect of no rate limiting. Valid value is an integer value between 0 and 1000000 representing Kbps. A value of 0 (initial value) disables broadcast rate limiting. This parameter is valid for LNW70/LNW170 VCGs and LNW78 Ethernet over SONET (EoS) VCGs only if the selected port is part of a virtual switch and the VLAN Tagging Mode of the circuit pack is set to *Switched*.
lcasmd	**LCAS Mode**. This parameter controls whether LCAS (Link Capacity Adjustment Scheme) is enabled for the specified VCG. When enabled, the LCAS protocol allows for hitless changes to the provisioned size of the VCG. Values for LCAS Mode: • ENABLE (initial value) • DISABLE The lcasmd parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74, LNW87 and LNW78 circuit packs
htmr	**Hold-Off Timer (in milliseconds)**. This parameter specifies the delay between when a tributary is detected faulty and when it is automatically removed from the VCG. It allows underlying protection, if any, to react first for removal of failed links. It applies to all tributaries in the specified VCG Values: • 0 to 10,000 ms (10 sec), in 100 millisecond steps. Initial value is 200ms. • 99,999 ms (represents infinity). If the vlantagmd is changed to SWITCHED on the LNW70/LNW170, htmr values for all VCGs will be set to the initial value of 99,999. This parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74, LNW87 and LNW78 Ethernet ports and is in effect only if LCAS Mode (lcasmd) is set to ENABLE.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
wtr	**Wait-to-Restore (in seconds)**. This parameter specifies the delay between when a tributary, previously removed from the VCG because of fault, is detected to be normal and when it is automatically returned to the VCG. It applies to all tributaries in the specified VCG. Values are from 0 to 3600 seconds in 1 second steps (initial value = 5). This parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74, LNW87 and LNW78 Ethernet ports and is in effect only if LCAS Mode (lcasmd) is set to ENABLE.
vcat	**Virtual Concatenation Mode**. Specifies whether H4 is inserted/monitored for the specified VCG. It has effect only when a single trib, not VT, is cross-connected to the VCG, to allow interworking with non-VCAT equipment. Valid values are • ENABLE (default) • DISABLE The vcat parameter applies only to the LNW63, LNW64, LNW70/LNW170, LNW74, LNW87 and LNW78 circuit packs.
porttype	**Port Type**. Specifies whether the port is at the boundary of the DiffServ domain or is a port interior to the DiffServ domain. Used in provisioning QoS services. Values are: • BOUNDARY (only allowed value for the LNW78). • INTERIOR (initial value for the LNW70/LNW170). This parameter applies only to the LNW70/LNW170 and LNW78 circuit pack, when the port is part of a virtual switch, and vlantagmd is SWITCHED.
portrole	**Port Role**. Port Role controls how tags are added/removed/processed. In typical applications, “boundary” ports are “customer” ports and “interior” ports are “network” ports. Port role has the following values: Valid values are • Customer (Initial and only allowed value for the LNW78). • Network (Initial value for LNW70/LNW170. Port must not have a default VLAN ID or porttag). This parameter applies only to the LNW70/LNW170 and LNW78 circuit pack ports, when the port is part of a virtual switch, and vlantagmd is SWITCHED.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
trafmgmtmd	**Traffic Management Mode**. Specifies how the packets will be divided into traffic flows and the services that can be provided at the port. Values are: • NOTC: This mode is valid for Boundary ports (see porttype) only in TRANS and 802.1Q tagmd (see ENT-VRTSW). It is also valid for Private Line ports. There is no traffic conditioning of packets that are received at the port. This mode emulates behavior of the LNW66/67/68. User_priority values 0, 1, 2 and 3 are mapped to CoS 0 and user_priority values 4, 5, 6 and 7 are mapped to CoS 3. The p-bits of the user frames are not changed. This mode is supported for the LNW70/LNW170. Initial value for the LNW70/LNW170. • PORT: This mode is valid for Boundary ports only (see porttype) in TRANS and 802.1Q tagmd (see ENT-VRTSW). All traffic received at the port is processed by a single traffic conditioner. The user_priority bits are remarked with the dftpri and the drop precedence determined from the traffic conditioner according to the provisioned mapping (see ED-ERATE). This mode is supported for the LNW70/LNW170 and LNW78. Initial value for the LNW78. • COSPORT: This mode is valid for BOUNDARY ports only (see porttype) in 802.1q tagmd (LNW70/LNW170, LNW78) and TRANS tagmd (LNW70/LNW170 only) (see ENT-VRTSW). All traffic received at the port that is tagged with the same 802.1p user_priority is processed by a single traffic conditioner for the CoS that is provisioned for that user_priority (see userpri2cos in ED-ERATE). There can be one service for each provisioned CoS at the port. For 802.1q tagmd, the user_priority bits are remarked with the original CoS and the drop precedence, which was determined from the traffic conditioner, according to the provisioned user_priority mapping (see ED-ERATE). For TRANS tagmd, the CoS level for untagged traffic is set to the default priority (dftpri) or 0 if dftpri is NA. The added stacked/outermost TAG user_priority bits are marked with the CoS and the drop precedence, which was determined from the traffic conditioner, according to the customer user_priority mapping (see ED-ERATE). But the customer VLAN TAG user_priority bits are untouched and preserved.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
trafmgmtmd (cont.)	• TAGPORT: This mode is valid for Boundary ports only (see porttype) in 802.1Q tagmd (see ENT-VRTSW). All traffic received at the port that is tagged with the same VLANid is processed by a single traffic conditioner. The user_priority bits are remarked with the dftpri2cos (see ED-ERATE) and the drop precedence determined from the traffic conditioner according to the provisioned mapping (see ED-ERATE). This mode is supported for the LNW70/LNW170. • COSTAGPORT: This mode is valid for BOUNDARY ports only (see porttype) in 802.1Q tagmd (see ENT-VRTSW). All traffic received at the port that is tagged with the same VLANid and the same CoS is processed by a single traffic conditioner for the VLANid and that CoS. There can be one service for each provisioned CoS (up to 4) on each provisioned VLANid at the port. The user_priority bits are remarked with the original CoS and the drop precedence, which was determined from the traffic conditioner, according to the provisioned user_priority mapping (see ED-ERATE). This mode is supported for the LNW70/LNW170.
hlayercos	**Higher layer Class of Service (CoS)**. This determines whether the packets will be classified by a higher layer protocol such as DiffServ Code Point (DSCP) in the IP header. Higher layer classification is only supported when trafmgmtmd in set to PORT. Values: • NONE: Higher layer not used for classification (initial value). • DSCP: Use the DSCP bits in the IP header for classification. This parameter applies only to an LNW70/LNW170 circuit pack port.
qwt_ntwkAF	**Network Port AF Queue Weighting Factor (WF)**. Specifies the weighting factor used by the queue service algorithm for the AF queue for packets coming from network ports. (A network port is a port without a default VLAN/Port Tag.) Valid value is an integer between 1 and 100 (highest weight). Default is 64. This parameter applies only to an LNW70/LNW170 circuit pack port that is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED.
qwt_custAF	**Customer Port AF Queue Weighting Factor (WF)**. Specifies the weighting factor used by the queue service algorithm for the AF queue for packets coming from customer ports. A customer port is a port with a default VLAN/Port Tag, or an Ethernet (LAN) port. Valid value is an integer between 1 and 100 (highest weight). Default is 36. This parameter applies only to an LNW70/LNW170 circuit pack port that is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
qsz	**Total Queue Size**. Specifies the total queue size for the port, including the EF and AF queues as well as the management queues. Beginning in Release 9.1, VCGs on LNW70/170 (in private line mode) support the following values for total queue size. • NA (default) Not Applicable. The ingress queue size is automatically set as a function of mtu_size and fcmd, consistent with releases prior to Release 9.1 • 128 The ingress queue size is 128 Kbytes. This value is supported for FE ports only. • 512 The ingress queue size is 512 Kbytes. This value is supported for GE ports only. VCGs on the LNW70/LNW170 support the queue size parameter. If the vcg is part of a virtual switch and the VLAN Tagging Mode (vlantagmd) is set to SWITCHED, valid value is an integer between 0 and 256 Kbytes (default is 256 Kbytes). The value cannot be greater than the maximum supported frame size. Refer to the MTU Size parameter.
qminthldy	**Yellow Packet Minimum (Min) Drop Threshold**. Specifies the minimum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 99 (default is 33). Value must be less than the Yellow Max Drop Threshold. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.
qmaxthldy	**Yellow Maximum (Max) Drop Threshold**. Specifies the maximum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 100 (default is 50). Value must be greater than the Yellow Min Drop Threshold and less than or equal to the Green Min Drop Threshold This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
qminthldg	**Green Minimum (Min) Drop Threshold**. Specifies the minimum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 100 (default is 90). Value must be greater than or equal to the Yellow Max Drop Threshold. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW70/LNW170 and the LNW78.
qdropwt0	**CoS 0 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 0 packets used by the drop algorithm. Valid value is an integer between 0 and 100% (default value is 100%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only to an LNW70/LNW170 circuit pack port that is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED.
qdropwt1	**CoS 1 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 1 packets used by the drop algorithm. Valid value is an integer between 0 and 100% (default value is 100%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only to an LNW70/LNW170 circuit pack port that is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED.
qdropwt2	**CoS 2 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 2 packets used by the drop algorithm. Valid value is an integer between 0 and 100% (default value is 100%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only to an LNW70/LNW170 circuit pack port that is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED.
qdropwt3	**CoS 3 Packets Drop Probability Mark**. Specifies the maximum drop probability mark for CoS 3 packets used by the drop algorithm. Valid value is an integer value between 0 and 100% (default value is 50%). qdropwt0 must be ≥ qdropwt1 ≥ qdropwt2 ≥ qdropwt3. This parameter applies only to an LNW70/LNW170 circuit pack port that is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED.

Table 11-2 ED-VCG command provisionable parameters (continued)

Parameter	Description
ethfcs	**Ethernet Frame Check Sequence** (FCS). Controls whether to drop errored frames due to FCS or let them pass. Regardless of this setting, errored frames are always counted in the EFCRC counter. Values: • ENABLE (Initial value) - Drop errored frames. • DISABLE - Pass errored frames. This parameter applies only to the LNW63.
locked_sa	**Locked Source Address**. This parameter controls whether the virtual switch restricts admission of packets, with source addresses matching ENT-MAC entries with type=PERSISTENT, to this port, and only this port; and discards all others on this port. Values: • ENABLE (source addresses locked). • DISABLE (Initial value). This parameter applies only to the LNW70/LNW170 and only if the port is part of a virtual switch when vlantagmd is SWITCHED [see ED-EQPT], and the porttype is BOUNDARY. It can be enabled only if there are no ENT-MAC entries with type=FILTERED.

Procedure 11-13: Provision Ethernet circuit pack parameters

Overview

This procedure provides a list of provisionable parameters for Ethernet circuit packs.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisioning Ethernet circuit pack parameters.

1 Use the **ed-eqpt** TL1 command or select **Configuration** → **Equipment** from the System View menu. Select the Ethernet circuit pack being provisioned, then click **Select**.

2 Use Table 11-3, "ED-EQPT command provisionable parameters" (p. 11-103) as reference to provision the necessary parameters from your work instructions.

END OF STEPS

ED-EQPT command parameters

Table 11-3, "ED-EQPT command provisionable parameters" (p. 11-103) lists the provisionable parameters for the Ethernet circuit packs:

Table 11-3 ED-EQPT command provisionable parameters

Parameter	Description
type	**Equipment Type**When addressed to a slot AID, the legal value is ETHPK (Ethernet circuit pack). Other values are valid when the slot is not equipped with an Ethernet pack.

Table 11-3 ED-EQPT command provisionable parameters (continued)

Parameter	Description
brst	**Burst Size** (1-255): Burst size determines the length or size of the burst that will be allowed by the peak information rate (PIR) policer. The valid range is 1 to 255. The default is 5. A larger value of burst size means that larger bursts will be allowed; a smaller value of burst size means that the PIR is more strictly enforced and less *burstiness* is allowed. This parameter affects policing for all VLANs (in 802.1Q mode) or all port tags (in transparent mode). This parameter applies to the LNW66, LNW67, and LNW68 Ethernet circuit packs.
cint	**Credit Interval** (1-4095): Credit interval for adding tokens to the token buckets used by the peak information rate (PIR) policer. The valid range is 1 to 4095. The default is 125, which corresponds to an interval of approximately 65.5 ms. The minimum value of 1 corresponds to an interval of 524.288 us. The maximum value of 4095 corresponds to 2.15 sec. This parameter affects policing for all VLANs (in 802.1Q mode) or all port tags (in transparent mode). This parameter applies to the LNW66, LNW67, and LNW68 Ethernet circuit packs.
eccmode	**Ethernet Cross Connect Mode** • **STS1** - STS-1 Cross-Connect mode supports only STS-1 cross-connections. For the LNW71, STS1 mode supports up to two STS-1 cross-connections to each VCG (1-24). For the LNW70/LNW170, STS1 mode supports up to 48 STS-1 cross-connections to VCG 1-2, 32 STS-1 cross-connections to VCG 3-28, and 10 STS-1 cross-connections to VCG 29-32. For the LNW78, STS1 mode supports up to 24 STS-1 cross-connections to VCG 1-2. • **STS3c** - STS-3c Cross-Connect mode supports at most one STS-3c *or* one STS-1 cross-connection to each of the first 16 VCGs (1-16), (VCGs 17-24 are not used). Applies only to the LNW71 circuit pack. • **STS12c** - STS-12c Cross-Connect mode supports STS-3c, STS12c,*or* virtual concatenated STS3c cross-connections to each VCG. Applies to the LNW70/LNW170 and LNW78 circuit packs. This parameter applies to the LNW70/LNW170, LNW71, and LNW78 circuit packs.

Table 11-3 ED-EQPT command provisionable parameters (continued)

Parameter	Description
enetmd	Ethernet **Port Configuration**. This parameter allows the Ethernet ports to operate with different PTMs. This parameter is valid when **type = ETHPK**. This parameter does not apply to the LNW87. See lnrate (**Line Rate**) in ed-eport. Values are: • **GX_FX** (initial value). For the LNW70/LNW170, sets ports 1-4 to operate with optical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs. For the LNW78, sets ports 1-2 to operate with optical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs. • **GT_FX** For the LNW70/LNW170, sets ports 1-4 to operate with electrical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs. For the LNW78, sets ports 1-2 to operate with electrical GbE PTMs. Sets ports 5-8 to operate with optical FE PTMs. • **FT_FX** For the LNW70/LNW170, sets ports 1-4 to operate with electrical FE PTMs. Sets ports 5-8 to operate with optical FE PTMs. For the LNW74, enables electrical FE backplane ports 1-16 and sets ports 17-24 to operate with optical FE PTMs. Provisionable for the LNW74 only when the main slots are equipped with VLF OLIU circuit packs. • **FX** For the LNW74, disables electrical FE backplane ports 1-16 and sets ports 17-24 to operate with optical FE PTMs. Provisionable for the LNW74 only when the main slots are equipped with VLF OLIU circuit packs. • **GX_FT** For the LNW70/LNW170, sets ports 1-4 to operate with optical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs. For the LNW78, sets ports 1-2 to operate with optical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs. • **GT_FT** For the LNW70/LNW170, sets ports 1-4 to operate with electrical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs. For the LNW78, sets ports 1-2 to operate with electrical GbEs PTMs. Sets ports 5-8 to operate with electrical FE PTMs. • **FT** For the LNW70/LNW170, sets ports 1-8 to operate with electrical FE PTMs.

Table 11-3 ED-EQPT command provisionable parameters (continued)

Parameter	Description
enetmd (continued)	• **GX** (initial value) For the LNW63 sets ports 1-4 to operate with optical GbE PTMs. For the LNW64 sets ports 1-8 to operate with optical GbE PTMs. • **GT** For the LNW63 sets ports 1-4 to operate with electrical GbE PTMs. For the LNW64 sets ports 1-8 to operate with electrical GbE PTMs. • **GT_GX** For the LNW64, sets ports 1-4 to operate with electrical GbE PTMs. Sets ports 5-8 to operate with optical GbE PTMs.
fefi_code	**Far End Fault Indication Code** is a 2 digit hexadecimal number in the range 03 to FE. The initial value is 05. (If a single digit is entered, it is padded with a zero to the left. For example, 5 is interpreted as 05). fefi_code is applicable only for LNW74, LNW70/170, and LNW87 circuit packs and is specified on a circuit pack basis.
mst	**Socket Maintenance State**. This parameter applies to equipped sockets only. Values are: • **Normal** - While in the normal state, any subsequent removal of the pluggable transmission module is reported with the assigned ASAP alarm severity level. • **Maint** - While in the maintenance state, any subsequent removal of the pluggable transmission module is reported with an alarm severity level of a standing condition regardless of the assigned ASAP alarm severity level.

Table 11-3 ED-EQPT command provisionable parameters (continued)

Parameter	Description
prot_state	**Slot Protection state**. This parameter specifies the protection state for the companion circuit packs in a slot pair. Values are: • **PROT** - protected. • **UNPROT** - unprotected. This parameter applies only to LNW170 Ethernet circuit packs. When a slot pair is equipped with LNW170 circuit packs, provisioning the slot prot_state to PROT sets the packs to be equipment protected and assigns certain corresponding ports on the companion circuit packs to the same fixed link aggregation groups: LAG1 (slot 1, port 1 and slot 2, port 1); LAG2 (slot 1, port 2 and slot 2, port 2); LAG3 (slot 1, port 5 and slot 2, port 5); LAG4 (slot 1, port 6 and slot 2, port 6). When prot_state is provisioned to UNPROT, if the NE is equipped with VLF MAINs, the LNW170 circuit packs are unprotected and the corresponding ports on the companion packs operate independently. If the NE is equipped with non-VLF MAINs, the LNW170 in the slot addressed by the ED-EQPT command is unprotected and any circuit pack in the companion slot is alarmed.
taudit	**Transmission audit**. Enables or disables the LNW70/LNW170 transmission audit. The transmission audit is a consistency check between counters on various hardware devices on the LNW70/LNW170 circuit pack. A transmission audit failure will result in a LAN or VCG segment audit failed alarm or equipment NP audit failed alarm. Values are: • **ENABLED** - Enables the transmission audit function. This is the initial value. • **DISABLED** - Disables the transmission audit function. This parameter applies only to LNW70/LNW170 Ethernet circuit packs. When taudit is provisioned for a protected LNW170 circuit pack, the provisioned value will apply to both circuit packs of the protected pair.

Table 11-3 ED-EQPT command provisionable parameters (continued)

Parameter	Description
vlantagmd	**Vlan Tagging Mode**. • **802.1TAG** - IEEE 802.1Q mode. Default value for FE circuit packs. Allows VLAN ID assignments to LAN and VCG ports for customer identification. Applies to the LNW66, LNW67, and LNW68 circuit packs only. • **TRANS** - Transparent mode. Allows Port Tag provisioning independent of customer VLANs. Applies to the LNW66, LNW67, and LNW68 circuit packs only. • **NOTAG** - No VLAN or port tag assignments. Accepts all customer packets. Default value for the LNW70/LNW170 and LNW78 circuit packs. Only mode of operation for the LNW63, LNW64, LNW71, LNW87 and LNW74 circuit packs. • **SWITCHED** - In this mode, switched Ethernet ports are allowed on the Ethernet circuit pack. The vlantagmd (TRANS or 802.1TAG) is selectable per virtual switch (ent-vrtsw), not on the circuit pack. Applies to the LNW70/LNW170 and LNW78 circuit packs. Only mode of operation for the LNW78 circuit pack.
vt_vcat	**VT Virtual Concatenation**: Determines the number of STS-1s dedicated to VT virtual concatenation. A value of **0** indicates that VT virtual concatenation is disabled. A value of **12** indicates that 12 STS-1s (336 VT1.5s) are reserved for VT virtual concatenation. Up to 63 VT1.5s may be assigned to any VCG. Applies to the LNW74 circuit pack only.

Procedure 11-14: Establish point-to-point BLSR protected 1GbE full rate private line service (NOTAG mode)

Overview

This procedure provides an example for configuring point-to-point BLSR protected full rate GbE private line Ethernet service using the NOTAG tagging mode. See Figure 11-11, "Point-to-Point 1GbE full rate private line example" (p. 11-115) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.

Steps

Use this procedure as an example for configuring a point-to-point BLSR protected 1GbE full rate private line service (NOTAG mode). See Figure 11-11, "Point-to-Point 1GbE full rate private line example" (p. 11-115) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 **Important!** If the Ethernet circuit pack is already in service, the existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode, and other parameters.

6 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.
the tagging mode is set correctly to NOTAG but other parameters are not correct,	Proceed to Step 9.
the tagging mode is NOT set to NOTAG,	Continue with Step 7.

7 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

8 If required, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

9 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

10 Verify/Select **NOTAG** in the Select VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]) as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each non terminating node in the network and the **2F BLSR Add/Drop** cross-connections to be made at the terminating nodes.

Important! Note that full rate Gigabit service requires 21 STS-1 or equivalent cross-connections.

13 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the **2-Way Point-to-Point, Through** and **2F BLSR Add/Drop** cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

14 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

15 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

16 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

17 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

18 **Important!** For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

19 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

20 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 21.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.

3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 18.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

21 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

22 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Repeat from Step 21 for each LAN port being provisioned.

23 PROVISION VCGS

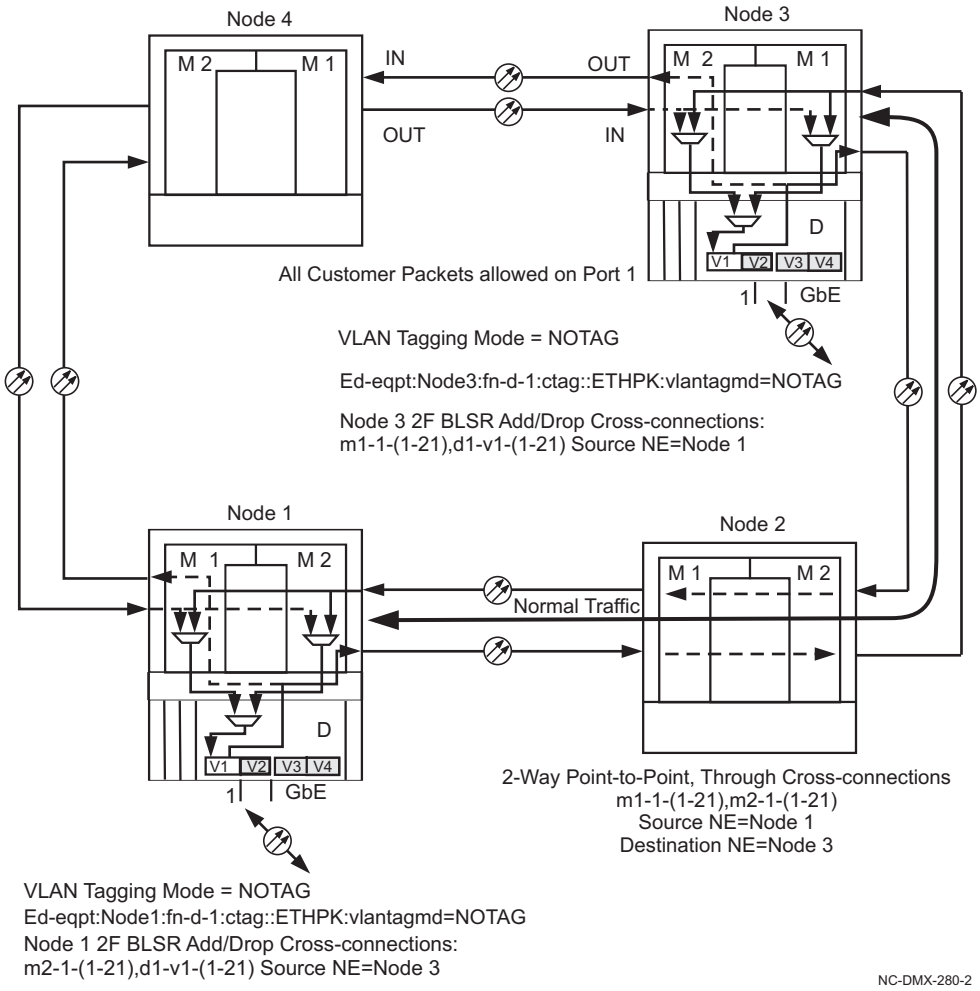
Use the **`ed-vcg`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the previous step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: “Provision Ethernet VCG parameters” (p. 11-89)

24 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Repeat from Step 23 for all WAN (VCG) port you want to provision. Click **Close** to exit.

END OF STEPS

Figure 11-11 Point-to-Point 1GbE full rate private line example



Procedure 11-15: Establish point-to-point BLSR protected GbE service (802.1q mode)

Overview

This procedure provides an example for configuring point-to-point BLSR protected GbE Ethernet service using the 802.1q tagging mode. See Figure 11-12, "Point-to-Point GbE using 802.1q tagging mode" (p. 11-124) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (802.1q) and virtual switch ID.

Steps

Use this procedure as an example for configuring point-to-point BLSR protected GbE Ethernet service using the 802.1q tagging mode. See Figure 11-12, "Point-to-Point GbE using 802.1q tagging mode" (p. 11-124) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 **Important!** If the Ethernet circuit pack is already in service, the existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68 circuit packs must be set to **`802.1TAG`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

6 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 9.
the tagging mode is NOT set correctly,	Continue with Step 7.

7 Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

If a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

8 If a virtual switch has been provisioned, delete it by using the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

9 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

10 Verify/Select the tagging mode in the Select VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

ASSIGN VIRTUAL SWITCH ID

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **ent-vrtsw** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select **802.1TAG** for the **Virtual LAN Tagging Mode**.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **dlt-vrtsw** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **802.1TAG** for the **Virtual LAN Tagging Mode**.
- For circuit packs in service with a virtual switch assigned:
  - Use the TL1 **ed-vrtsw** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **802.1TAG** for the **Virtual LAN Tagging Mode**.

13 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary **`2F BLSR Add/Drop`** and **`2-Way Point-to-Point, Through`** cross-connections to be made at each terminating and non terminating node in the network.

Important! Note that full rate Gigabit service requires 21 STS-1 or equivalent cross-connections.

14 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the non terminating nodes in the network to provision the **`2-Way Point-to-Point, Through`** cross-connections, and at the terminating Ethernet nodes to provision the **`2F BLSR Add/Drop`** cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204)

15 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

16 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

17 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

18 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 **Important!** For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

20 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

21 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 22.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.

3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 19.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

22 **NOTICE**

Service-disruption hazard

After the VLAN ID for customer untagged frames is assigned and service is established in the 802.1q mode, changing the VLAN ID may affect service. If the VLAN IDs are different, service will be affected.

When the VLAN ID for customer untagged frames is changed at one point in the network, the VLAN ID must be changed at all points.

ASSIGN VLAN IDs

Use the TL1 **`ent-vlan`** command to assign the default VLAN ID for customer untagged frames or the customer VLAN ID for tagged frames to the associated LAN ports and VCG WAN ports. Or select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. For example, see Figure 11-12, “Point-to-Point GbE using 802.1q tagging mode” (p. 11-124).

Reference: In Figure 11-12, "Point-to-Point GbE using 802.1q tagging mode" (p. 11-124), assume a GbE circuit pack is installed in Function slot d-1 and LAN port 2 at each circuit pack is used for service.

Note that a service has been established between Node 1 and Node 3 for customer untagged frames using a default VLAN ID of 34.

Note that a service has been established between Node 1 and Node 3 for customer tagged frames using a VLAN ID of 55.

23 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

24 Click **Apply**. Read the warning message, then click **Yes** to execute the command.

25 PROVISION VCGS

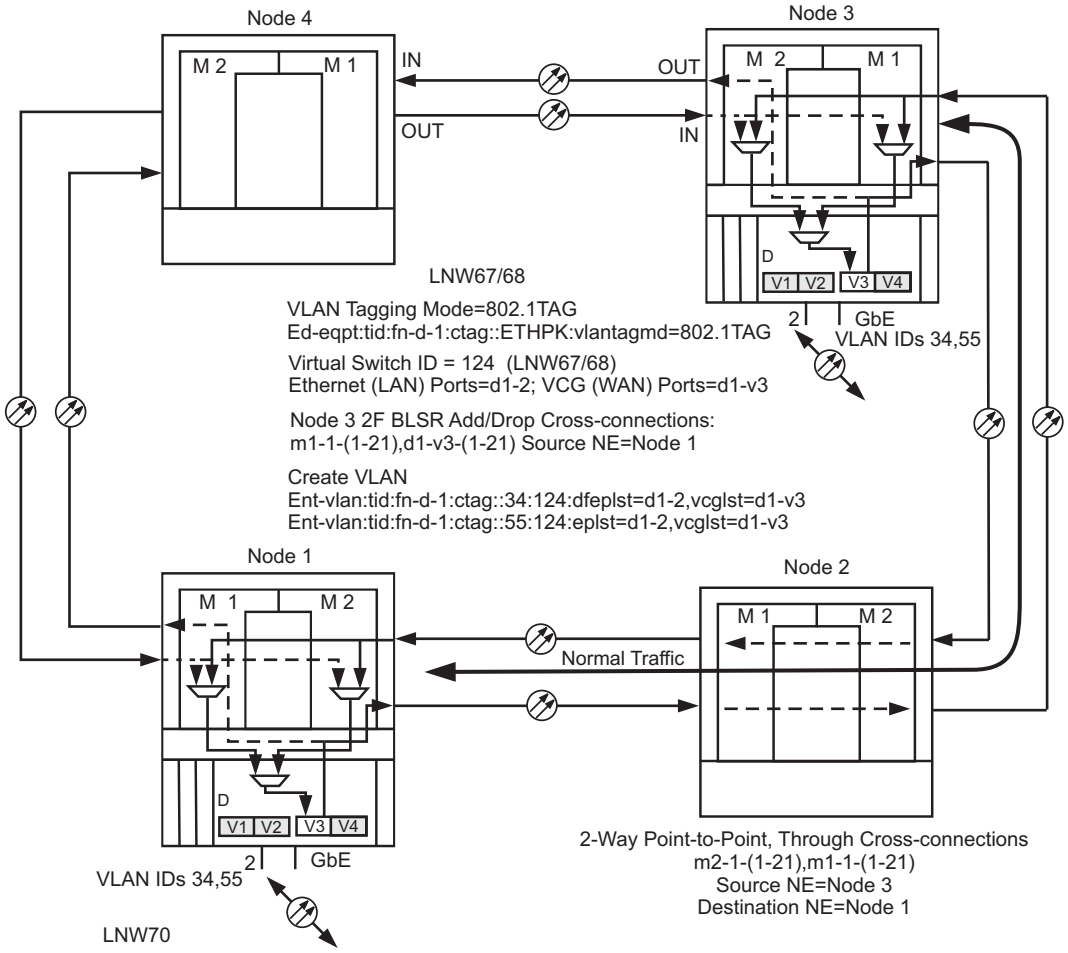
Use the **`ed-vcg`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the previous step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

26 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit or repeat from Step 23 for other port provisioning.

END OF STEPS

Figure 11-12 Point-to-Point GbE using 802.1q tagging mode



VLAN Tagging Mode=SWITCHED (LNW70)
Cross Connect Mode=STS1 (LNW70)
Ed-eqpt:tid:fn-d-1:ctag::ETHPK:vlantagmd=switched,eccmode=sts1

Virtual Switch ID = 124 (LNW70)
Virtual LAN Tagging Mode= 802.1TAG (LNW70)
Ent-vrtsw:tid:fn-d-1:ctag::124:eplst=d1-2,vcglst=d1-v3,tagmd=802.1TAG

Node 1 2F BLSR Add/Drop Cross-connections:
m2-1-(1-21),d1-v3-(1-21) Source NE=Node 3

Create VLAN
Ent-vlan:tid:fn-d-1:ctag::34:124:dfeplst=d1-2,vcglst=d1-v3
Ent-vlan:tid:fn-d-1:ctag::55:124:eplst=d1-2,vcglst=d1-v3

NC-DMX-281-2

Procedure 11-16: Establish point-to-point BLSR protected GbE service (transparent mode)

Overview

This procedure provides an example for configuring initial point-to-point BLSR protected GbE Ethernet service using the transparent tagging mode. See Figure 11-13, "Point-to-Point GbE using transparent tagging mode" (p. 11-133) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (Transparent) and virtual switch ID.

Steps

Use this procedure as an example for configuring point-to-point BLSR protected GbE Ethernet service using the transparent tagging mode. See Figure 11-13, "Point-to-Point GbE using transparent tagging mode" (p. 11-133) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 **Important!** If the Ethernet circuit pack is already in service, the existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68 circuit packs must be set to **`TRANS`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

6 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 12.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 9.
the tagging mode is NOT set correctly,	Continue with Step 7.

7 Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

If a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

8 If a virtual switch has been provisioned, delete it by using the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

9 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

10 Verify/Select the tagging mode in the Select VLAN Tagging Mode box.

11 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

12



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and a new virtual switch created.

ASSIGN VIRTUAL SWITCH ID

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.
- For circuit packs in service with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command to change an assigned virtual switch ID or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to add/remove ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.

13 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary **`2F BLSR Add/Drop`** and **2-Way Point-to-Point, Through** cross-connections to be made at each terminating and non terminating node in the network.

Important! Note that full rate Gigabit service requires 21 STS-1 or equivalent cross-connections.

14 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections ** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the non terminating nodes in the network to provision the **2-Way Point-to-Point, Through** cross-connections, and at the terminating Ethernet nodes to provision the **`2F BLSR Add/Drop`** cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204)

15 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

16 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

17 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

18 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 **Important!** For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

20 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

21 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 22.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.

3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 19.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

22 CREATE PORT TAGs

Use the TL1 **`ed-eport`** and **`ed-vcg`** commands to assign port tags to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create Port Tag** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.

Important! The Peak Information Rate (PIR) rate limiting feature on the LNW66/LNW67/LNW68 circuit packs will not be effective in transparent mode if the Ethernet Type (ethertype) parameter for the LAN or WAN VCG ports is provisioned to any value other than FFFF or 8100.

23 PROVISION LAN (Ethernet) PORTS

Use the TL1 **`ed-eport`** command to provision parameters for the LAN port being provisioned. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit or continue with the next step.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

24 PROVISION WAN (VCG) PORTS

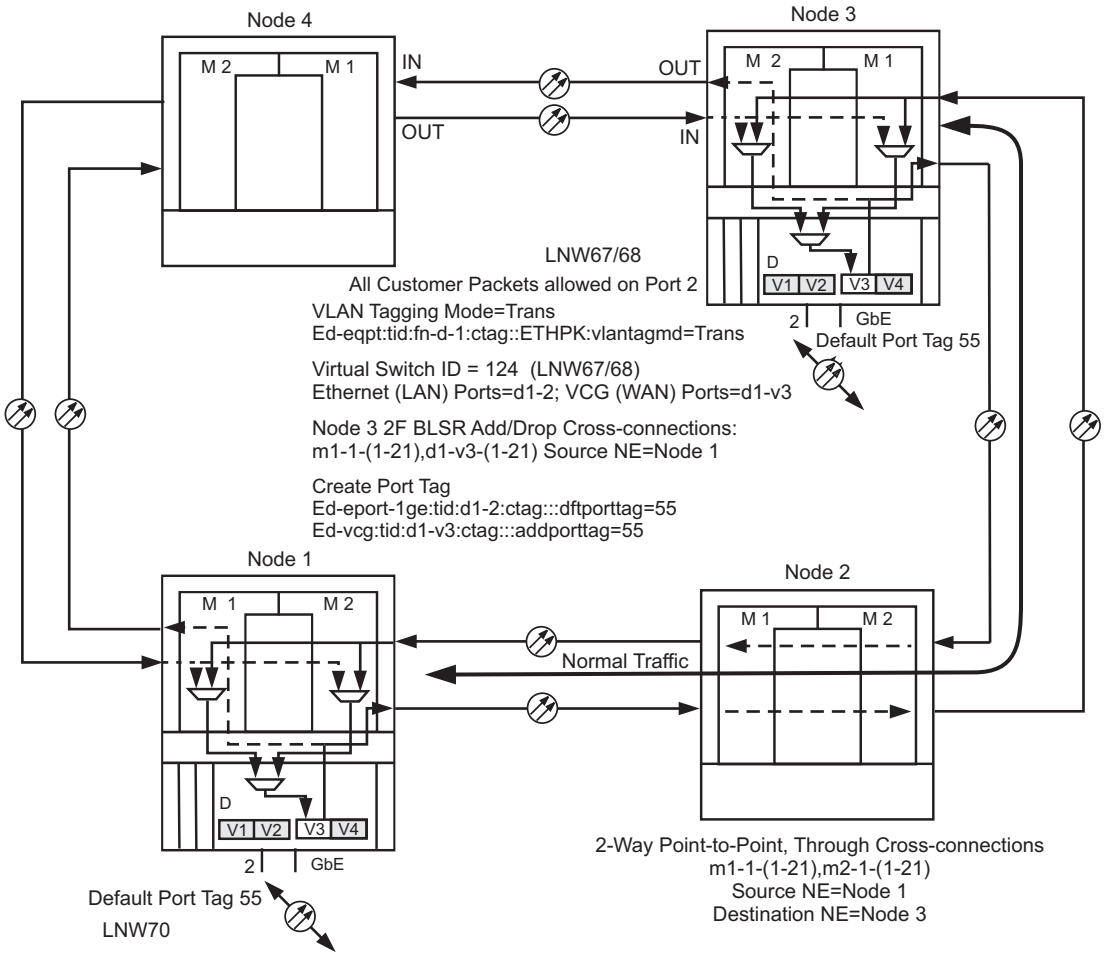
Use the TL1 **ed-vcg** command to provision parameters for the VCG ports, as required. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit.

Reference: Procedure 11-12: “Provision Ethernet VCG parameters” (p. 11-89)

END OF STEPS

Figure 11-13 Point-to-Point GbE using transparent tagging mode



All Customer Packets allowed on Port 2

VLAN Tagging Mode=SWITCHED (LNW70)
Cross Connect Mode=STS1 (LNW70)
Ed-eqpt:tid:fn-d-1:ctag::ETHPK:vlantagmd=switched,eccmode=sts1

Virtual Switch ID = 124 (LNW70)
Virtual LAN Tagging Mode= 802.1TAG (LNW70)
Ent-vrtsw:tid:fn-d-1:ctag::124:eplst=d1-2,vcglst=d1-v3,tagmd=TRANS

Node 1 2F BLSR Add/Drop Cross-connections:
m2-1-(1-21),d1-v3-(1-21) Source NE=Node 3

Create Port Tag
Ed-eport-1ge:tid:d1-2:ctag:::dftporttag=55
Ed-vcg:tid:d1-v3:ctag:::addporttag=55

MA-DMX-282-2

Procedure 11-17: Establish Ethernet packet ring on a BLSR with non-preemptible unprotected traffic (NUT)

Overview

This procedure provides an example for establishing an Ethernet packet ring on a bidirectional line switched ring (BLSR) with Nonpreemptible Unprotected Traffic (NUT) access (Release 3 or later).

A packet ring is a set of Ethernet switches (Ethernet circuit packs) connected to each other in a ring configuration. When the packet ring is first established, the capacity of the ring is predetermined by the number of STS-1 cross-connections (1-21 [LNW66/67/68], 1-48 [LNW70/LNW170]) applied to the ring and switches. The tagging mode, virtual switch ID, and spanning tree group is also predetermined. For example, see Figure 11-14, "Ethernet packet ring on a BLSR with NUT" (p. 11-143).

This procedure assumes that the BLSR ring network configuration has already been established and no alarms are present.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the nodes participating in the packet ring network.
- The shelf slots, circuit packs, ports, VCGs involved in the packet ring network.
- The number and type of cross-connections to be made at each node.
  For circuit packs not supporting LCAS, once the capacity of the packet ring is established, additional capacity (cross-connections) may not be added in service without service interruption.
- The tagging mode (transparent or 802.1q), virtual switch ID, and spanning tree group ID.

Steps

Use this procedure as an example to establish an Ethernet packet ring on a BLSR ring using NUT. See Figure 11-14, "Ethernet packet ring on a BLSR with NUT" (p. 11-143) for an example.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

As an alternative, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the packet ring being established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Reference: Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)

6 **Important!** If the Ethernet circuit pack is already in service, the existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW66/67/68 circuit packs must be set to **`TRANS`** or **`802.1TAG`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

Important! When GbE circuit packs are installed in the shelf, the default "NOTAG" mode is assigned to the circuit pack. When FE circuit packs are installed in the shelf, the default "802.1TAG" mode is assigned to the circuit pack.

7

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 13.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

If a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

9 If a virtual switch has been provisioned, delete it by using the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click Select. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

10 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

11 Verify/Select the tagging mode (**`802.1TAG`**, **`TRANS`**[LNW66/67/68], or **`SWITCHED`**[LNW70/LNW170]) in the VLAN Tagging Mode box.

12 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW66/67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

13



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

ASSIGN VIRTUAL SWITCH ID

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **dlt-vrtsw** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).
- For circuit packs in service with a virtual switch assigned:
  - Use the TL1 **ed-vrtsw** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

14 PROVISION NUT VALUES

Select **Configuration** → **Equipment** from the System View menu. Or use the TL1 **ed-protn-acc** command to provision the NUT values.

Result: The *Configure Equipment* window opens.

15 Select **Ptn Grp** tab from the bottom of the window, then select the required *2F BLSR* group and click **Select**.

Result: Parameters display for the selected protection group

16 Under Local NUT,

- Select the **NUT Rate** as **STS1**
- Select the **Time Slot Number(s)** (**1-24** for OC-48 or **1-96** for OC-192) you are provisioning.
- Select the **NUT Protection Attribute** as **Not Protected**.

Important! Note that each timeslot used for the multipoint cross-connections for the packet ring must be provisioned at each node (including intermediate pass-through nodes) with the NUT attribute of **Not Protected**.

17 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary **`Multipoint`** cross-connections to be made to each VCG at each terminating node. Determine any **`2-Way Point-to-Point, Through`** pass through cross-connections to be made at any non terminating nodes in the network.

Important! Note that, for full rate Gigabit packet rings on an OC-48 BLSR, cross-connections for the first packet ring using VCG 1(2) should use cross-connection time slots 1-21.

18 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard to provision the **`Multipoint`** Ethernet and the **`2-Way Point-to-Point, Through`** pass-through cross-connections. For example, see Figure 11-14, "Ethernet packet ring on a BLSR with NUT" (p. 11-143).

Reference: Refer to Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204) for cross-connection examples.

19 From the System View menu, select **View** → **Cross-Connections** to verify that the proper connections have been made.

20 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

21 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

22 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 **Important!** For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

24 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

25 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 26.

- If the VCG Monitoring Mode is **NMON**, (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.

3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 23.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

26 CREATE SPANNING TREE GROUP

If required, determine a preferred spanning tree configuration (span to be blocked under nominal conditions), the preferred root node, and spanning tree root priorities for this service.

Important! It is not necessary to determine a preferred spanning tree configuration. A default spanning tree configuration is configured when you establish the spanning tree group.

Reference: Procedure 11-25: “Create preferred spanning tree configuration” (p. 11-224)

27 Use the TL1 **`ent-stgrp`** command to assign and provision the parameters for the ports involved in the spanning tree group. Or select **Configuration** → **Data** → **Create Spanning Tree Group** command from the CIT System View menu. For example, see Figure 11-14, “Ethernet packet ring on a BLSR with NUT” (p. 11-143).

Important! Spanning tree default parameters support a network of up to nine nodes.

Networks running 802.1w rapid spanning tree protocol (Release 2 or later) support more than nine nodes participating in a spanning tree. To support more than nine nodes in the spanning tree, the maximum age timer must be increased. Note that spanning tree restoration time increases as the number of nodes increase.

If the network consists of more than nine (9) nodes which are participating in the spanning tree configuration, use the following formula to determine the proper setting for the spanning tree maximum age timer (**`stmaxage`**): 2N + 6, where N equals the number of nodes.

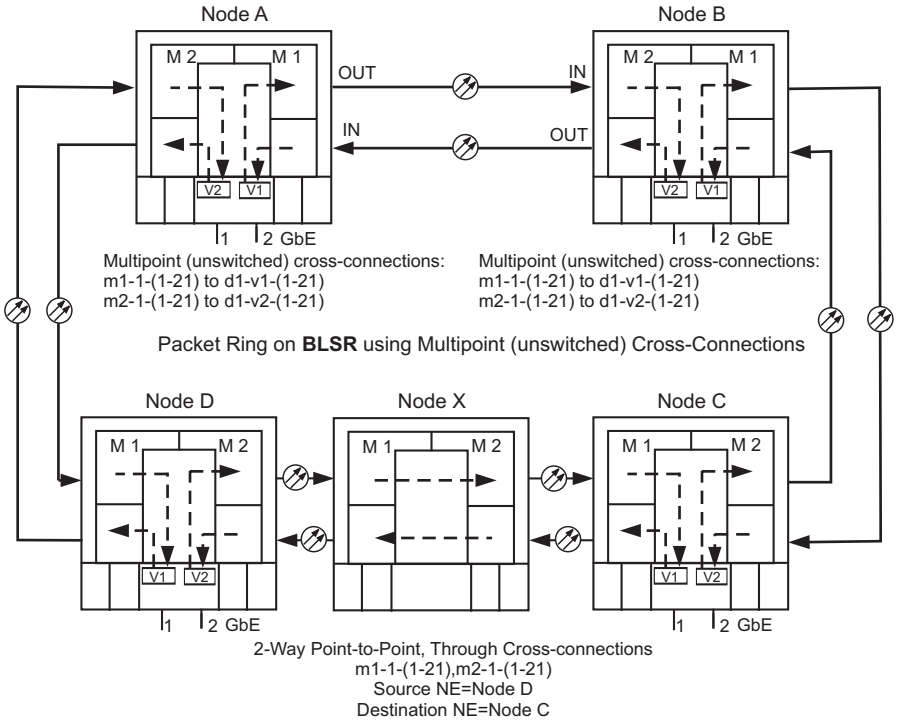
For example, if the network consists of 16 nodes, then the **`stmaxage`** timer should be set to 38 seconds: 2 x (16) + 6= 38.

28 Repeat all the assignments in this procedure at each Ethernet node in the network.

Important! All Ethernet nodes in the network must be in the same spanning tree group (that is, all VCGs, at each node, participating in the same spanning tree group must be assigned to the same spanning tree group ID).

END OF STEPS

Figure 11-14 Ethernet packet ring on a BLSR with NUT



Basic Provisioning at all nodes with ethernet:

LNW66/67/68

VLAN Tagging Mode = 802.1TAG or TRANS
ed-eqpt:tid:fn-d-1:ctag:ETHPK:vlantagmd=802.1q (Trans)

Virtual Switch ID (for example, 123)
Ethernet (LAN) Ports = d1-1
VCG (WAN) Ports = d1-v1, d1-v2

LNW70

VLAN Tagging Mode=SWITCHED (LNW70)
Cross Connect Mode=STS1 (LNW70)
Ed-eqpt:tid:fn-d-1:ctag::ETHPK:vlantagmd=switched,eccmode=sts1

Virtual Switch ID (for example, 123)
Virtual LAN Tagging Mode=Transparent or 802.1TAG
Ethernet (LAN) Ports = d1-1
VCG (WAN) Ports = d1-v1, d1-v2

NUT Value for cross-connections:
Configuration > Provision, select Ptn Grp, select BLSR protection group, click Provision. Provision NUT Value to “Not Protected” for all timeslots being used.

Cross-connections: See examples in figure above.

Spanning Tree Group ID (for example, 1)
ent-stgrp:tid::ctag::1,123:vcglst=d1-v1&d1-v2
Configuration > Data > Create A Spanning Tree, select ethernet circuit pack, click Select, enter parameters.

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Procedure 11-18: Add bandwidth to a point-to-point UPSR/BLSR protected GbE service (802.1q mode)

Overview

Use this procedure as an example for adding bandwidth to an in service point-to-point UPSR/BLSR protected GbE Ethernet service using circuit packs not supporting LCAS. For circuit packs supporting LCAS, see Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260).

This procedure provides an example for adding bandwidth to an in service point-to-point UPSR/BLSR protected GbE Ethernet service with minimal service interruption. This example uses the 802.1q tagging mode.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Cross-Connection Wizard to perform the cross-connection provisioning in this procedure and the **Configuration** → **Data** → **Create VLAN** to provision new VLANs. From the System View menu, select **Configuration** → **Cross-Connections** to invoke the wizard.

See Figure 11-15, "Example of adding bandwidth on UPSR" (p. 11-148) and Figure 11-16, "Example of adding bandwidth on BLSR" (p. 11-149) for examples.

> **Important!** To minimize service interruption, plan the addition of cross-connections. For example, do any new pass-through cross-connections first. Then at the appropriate time, coordinate and make the add/drop cross-connections at the terminating nodes at the same time, as close as possible.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of additional cross-connections to be made at each node.
- The tagging mode (802.1q) and virtual switch ID.
- Notify the customers on the existing service of the impending service interruption and coordinate your activities accordingly.
- Plan the activity of adding cross-connections to minimize service interruption.

Steps

Use this procedure as an example for adding bandwidth (cross-connections) to a point-to-point UPSR/BLSR protected GbE Ethernet service using the 802.1q tagging mode.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

As an alternative for BLSR rings, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, ports, and cross-connections to be made at each node associated with the service being added.

5 At each node in the network, use the **View** → **Cross-Connections** command from the System View menu at each node to verify that the new cross-connections are available for assignment at each NE. If any of the new cross-connections are already assigned, you must resolve the problem before continuing with this procedure.

6 ESTABLISH SONET PASS THROUGH CROSS-CONNECTIONS

Determine the necessary **`2-Way Point-to-Point, Through`** cross-connections to be made at each *non* terminating node in the network.

7 One at a time at each *non* terminating node in the network, use the TL1 **`ent-crs-sts1`** command to provision the pass-through cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the *non* terminating nodes in the network to provision the **`2-Way Point-to-Point, Through`** cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the *non* terminating nodes are pass-through.

Reference: Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204)

8 From the System View menu, select **View** → **Cross-Connections** at each *non* terminating node to verify that the proper connections have been made.

9 ESTABLISH SONET ADD/DROP CROSS-CONNECTIONS

At each terminating node in the network, coordinate your activities to activate the necessary cross-connections at the same time. Note that there will be some service interruption.

Use The TL1 **`ent-crs-sts1`** command to provision the add/drop cross-connections. Or, select **Configuration** → **Cross-Connections** from the system view menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the terminating nodes in the network to provision the **UPSR Ring Add/Drop** or **2F BLSR Add/Drop** cross-connections.

Important! Enter all your parameters for the cross-connections and coordinate with the other end as to when you enter/apply the command.

10 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

11 If alarms are present, look for missing or improperly made cross-connections.

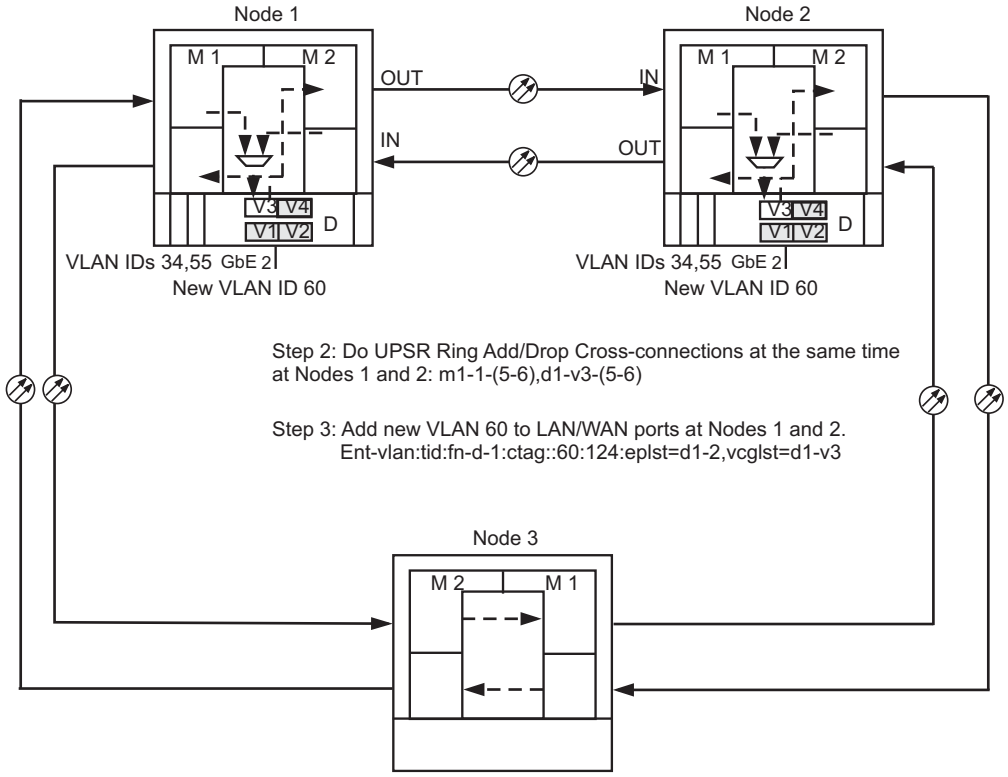
Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

12 ASSIGN VLAN IDs

If adding new customers, use the TL1 **`ent-vlan`** command to assign the new customer VLAN ID to the associated LAN ports and VCG WAN ports. Or select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu to open the Create New VLAN provisioning window.

END OF STEPS

Figure 11-15 Example of adding bandwidth on UPSR



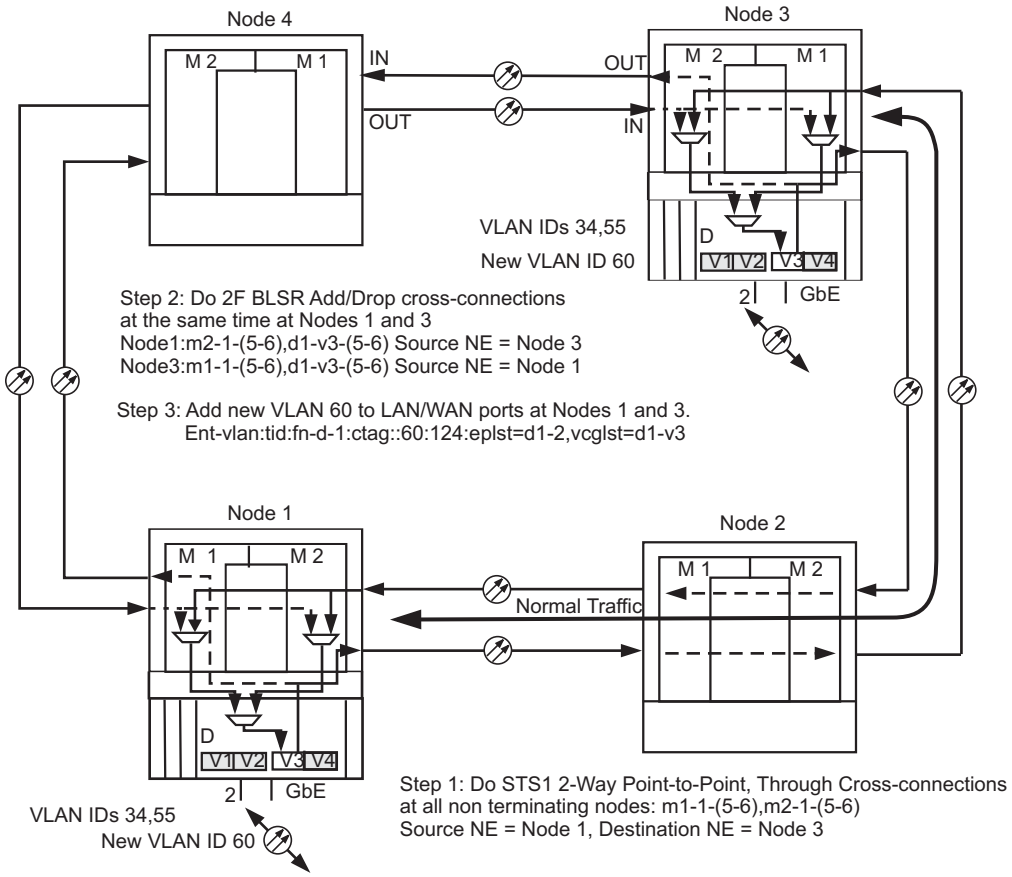
Original configuration:
Customer VLANs 34 and 55 share 4 STS1s in a point-to-point configuration.
Customers share 4 STS1s in Main, m1-1-(1-4), connected to VCG timeslots 1-4.
Virtual Switch ID=124

New configuration:
Add 2 more cross-connections, m1-1-5 and m1-1-6, for additional bandwidth.
Add new VLAN, 60, at each of the terminating nodes, Node 1 and Node 2.
Virtual Switch ID=124

Steps:
1. Add 2-Way Point-to-Point, Through cross-connection at Node 3.
2. At the same time, add the UPSR Ring Add/Drop
   cross-connections at Nodes 1 and 2.
3. Add VLAN ID 60 at Nodes 1 and 2.

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Figure 11-16 Example of adding bandwidth on BLSR



Original configuration:
Customer VLANs 34 and 55 share 4 STS1s in a point-to-point configuration.
Customers share 4 STS1s (1-4) in Main, connected to VCG timeslots 1-4.
Virtual Switch ID=124
New configuration:
Add 2 more cross-connections, timeslots 5-6, for additional bandwidth.
Add new VLAN, 60, at each of the terminating nodes, Node 1 and Node 3.
Virtual Switch ID=124

Steps:
1. Add **2-Way Point-to-Point, Through** cross-connection at Node 2.
2. At the same time, add **2F BLSR Add/Drop** cross-connections at Nodes 1 and 3.
3. Add VLAN ID 60 at Nodes 1 and 3.

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Procedure 11-19: Establish a dedicated multiple point private line UPSR protected GbE service (transparent mode)

Overview

This procedure provides an example for configuring a dedicated multiple point private line UPSR protected GbE Ethernet service using the Transparent tagging mode.

This procedure illustrates a dedicated bandwidth, private line service with per link bandwidth granularity with multiple connections. Although this procedure uses the transparent mode, this configuration could use the 802.1q tagging mode with VLAN assignments. Cross-connections and VCG assignments are the major considerations in this type of configuration. See Figure 11-17, “Dedicated multiple point GbE using transparent tagging mode” (p. 11-158) and Figure 11-18, “Dedicated multiple point GbE private line cross-connections” (p. 11-159).

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to “Before you begin” (p. 11-4) and “Required equipment” (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (transparent) and virtual switch ID.

Steps

Use this procedure as an example for configuring a dedicated multiple point private line UPSR protected GbE Ethernet service using the Transparent tagging mode.

1 Use the *WaveStar*® CIT to log in to each of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at *each* node associated with the service to be established. Refer to Figure 11-17, "Dedicated multiple point GbE using transparent tagging mode" (p. 11-158) and Figure 11-18, "Dedicated multiple point GbE private line cross-connections" (p. 11-159) for provisioning at each node.

5 At each node in the network, use the **View** → **Cross-Connections** command from the System View menu at each node to verify that the new cross-connections are available for assignment at each NE. If any of the new cross-connections are already assigned, you must resolve the problem before continuing with this procedure.

6



NOTICE

Service-disruption hazard

If the Ethernet circuit pack is already providing service, changing tagging mode will take down any existing service. The existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

Determine the existing tagging mode and parameters for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68 circuit packs must be set to **`TRANS`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

7 Select one of the following:

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 13.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

If a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

9 If a virtual switch already exists, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, highlight the circuit pack being provisioned, then click **Select**. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

10 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu. Select the circuit pack being provisioned, then click **Select**.

11 Verify/Select the tagging mode in the Select VLAN Tagging Mode box.

12 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval**[LNW67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

13



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

ASSIGN VIRTUAL SWITCH ID

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.

- For circuit packs in service with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select **Transparent** for the **Virtual LAN Tagging Mode**.

14 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

15 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the pass-through and add/drop cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that the sum of the three individual STS-1 links in an OC-48 ring configuration cannot exceed a total of 48 STS-1s. In an OC-192 ring configuration, the total of the three links cannot exceed 63 STS-1s. An individual link cannot exceed the maximum of 21 STS-1s.

Reference: Procedure 11-24: “Make cross-connections for Ethernet service” (p. 11-204)

16 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

17 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Ouput Direction.

If required, use the TL1 **ed-vcgtrib** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **Enabled** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

18 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

19 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

20

Important! For LNW70/LNW170 circuit packs, at least one tributary at each end of the circuit must be Enabled in order for the VCG to go in service.

If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

21 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

22 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 23.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),

Perform the following:

1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.
3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 20.

- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 CREATE PORT TAGs

Use the TL1 **`ed-eport`** and **`ed-vcg`** commands to assign port tags to the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create Port Tag** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.

Important! The Peak Information Rate (PIR) rate limiting feature on the LNW66/LNW67/LNW68 circuit packs will not be effective in transparent mode if the Ethernet Type (ethertype) parameter for the LAN or WAN VCG ports is provisioned to any value other than FFFF or 8100.

24 PROVISION LAN (Ethernet) PORTS

Use the TL1 **ed-eport** command to provision parameters for the LAN port being provisioned. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit or continue with the next step.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

25 PROVISION WAN (VCG) PORTS

Use the TL1 **ed-vcg** command to provision parameters for the VCG ports, as required. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Repeat for all ports being provisioned. Click **Close** to exit.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-17 Dedicated multiple point GbE using transparent tagging mode

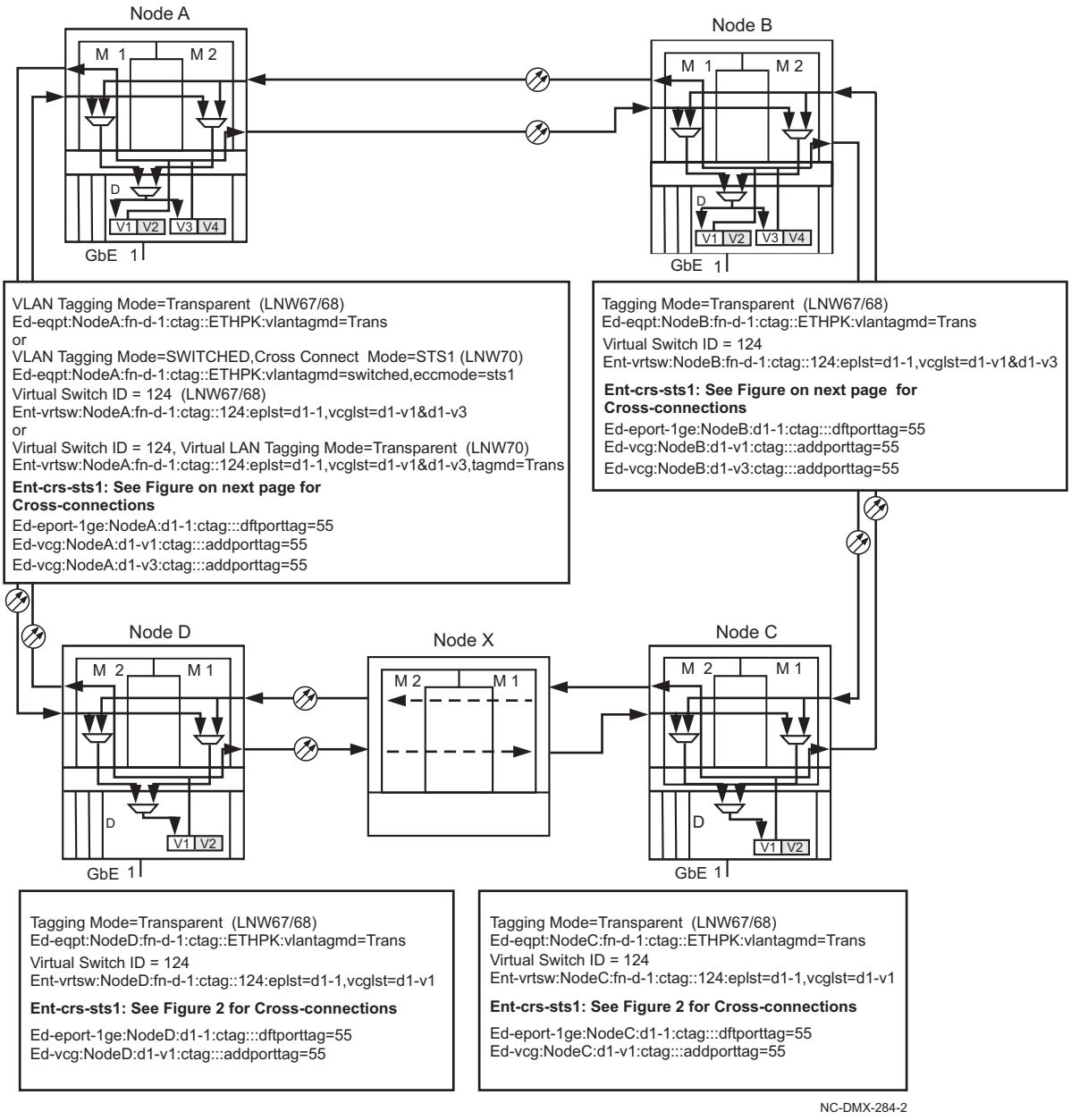
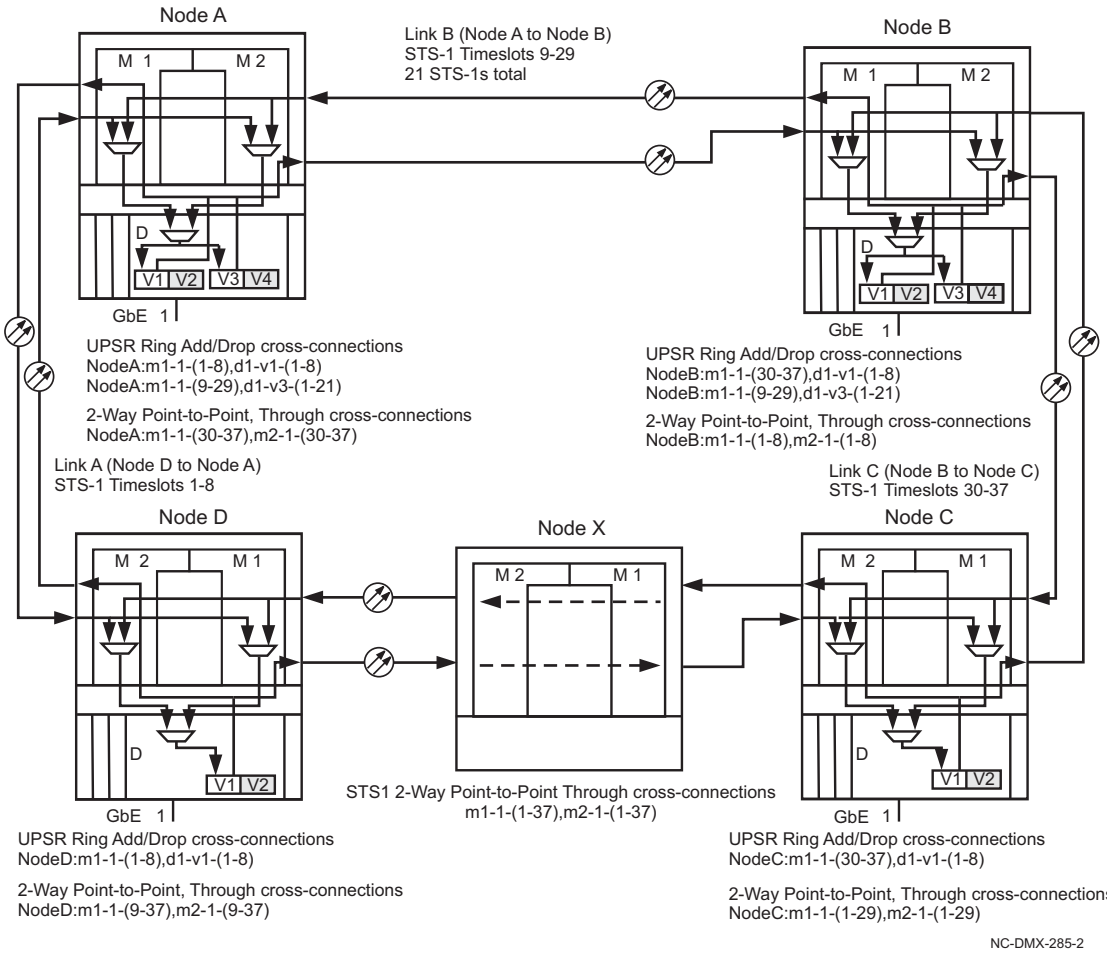


Figure 11-18 Dedicated multiple point GbE private line cross-connections



Procedure 11-20: Add Fast Ethernet services to Ethernet packet ring – FE to GbE hairpin

Overview

This procedure provides an example for adding 10/100T Fast Ethernet (FE) circuit pack services to a GbE packet ring. This procedure uses hairpin cross-connections and parameter settings to bind the FE services into an existing packet ring. See Figure 11-19, "Ethernet packet ring on a UPSR" (p. 11-168) and Figure 11-20, "FE to GbE Ethernet hairpin cross-connections and provisioning on packet ring" (p. 11-169) for an example.

When the packet ring is first established, the capacity of the ring is predetermined by the number of STS-1 cross-connections applied to the ring and switches. The tagging mode (**802.1TAG** or Transparent [**Trans**]), virtual switch ID, and spanning tree group assigned to the GbE circuit pack is also predetermined. This procedure uses the 802.1q tagging mode for an example.

This procedure assumes that a UPSR ring network configuration has already been established and no alarms are present. It also assumes that service has already been established from Node A, LAN port d1-1, WAN (VCG) d1-v1 and d1-v2 to Node C LAN port d1-10, WAN (VCG) d1-v1 and d1-v2, using VLAN ID 103.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the nodes participating in the packet ring network.
- The shelf slots, circuit packs, ports, VCGs involved in the packet ring network.
- The number and type of cross-connections to be made at each node.

  Note, that once the capacity of the packet ring is established, additional capacity (cross-connections) may not be added in service without service interruption.
- The tagging mode (transparent or 802.1q), virtual switch ID, and spanning tree group ID.

Steps

Use this procedure as an example to add FE services to an Ethernet packet ring on a UPSR ring.

1 Use the *WaveStar*® CIT to log in to each of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with this service.

5 Has the packet ring already been established? See Figure 11-19, "Ethernet packet ring on a UPSR" (p. 11-168) for an example.

If...	Then...
No,	Establish the packet ring first, then continue with the next step. Procedure 11-5: "Establish Ethernet packet ring on a UPSR" (p. 11-35)
Yes,	Continue with the next step.

6 Verify/Install the Fast Ethernet circuit pack into the required slot of the Function Unit group (A, B, C, or D) at the NE with the GbE circuit pack being used for the hairpin connections (Node A in this example).

Reference: Procedure 4-12: "Install 10/100 Ethernet circuit packs" (p. 4-61)

7 CONFIGURE FE TAGGING MODE

Determine the existing tagging mode for the FE circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the FE CP, then click **Select**. Note the VLAN Tagging Mode, Burst Size, and Credit Interval parameters.

Important! The tagging mode must be the same on both circuit packs being connected.

When FE circuit packs are installed in the shelf, the default **802TAG** mode is assigned to the circuit pack.

8

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 14.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 11.
the tagging mode is NOT set correctly,	Continue with Step 9.

9 Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the FE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

If a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

10 If a virtual switch has been provisioned, delete it by using the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click Select. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

11 Use the TL1 **ed-eqpt** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

12 Verify/Select the tagging mode (**802.1TAG**) in the Select VLAN Tagging Mode box.

13 Verify/Enter the **Burst Size** and **Credit Interval** parameter values as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

14



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

ASSIGN VIRTUAL SWITCH ID TO FE PORTS

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **ent-vrtsw** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    Note that the Virtual Switch ID for this example should be set to *123*, the same ID as in the GbE circuit pack on the packet ring. Also note that LAN ports c1-2 and c1-3, and VCG c1-v1 are assigned to the virtual switch.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **dlt-vrtsw** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    Note that the Virtual Switch ID for this example should be set to *123*, the same ID as in the GbE circuit pack on the packet ring. Also note that LAN ports c-2 and c-3, and VCG c-v1 are assigned to the virtual switch.

15 Add VCG port to Virtual Switch ID on GbE, if required.

Note that in this example, Figure 11-19, "Ethernet packet ring on a UPSR" (p. 11-168), we only assigned VCGs d1-v1 and d1-v2 to virtual switch ID 123 when we created the packet ring. We now need to add VCG d1-v3 to the same virtual switch ID. Note that we should have added d1-v3 to the virtual switch when we established the packet ring.

Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Determine if VCG d1-v3 is already assigned to virtual switch ID 123.

If VCG d1-v3 is *not* assigned to virtual switch ID 123, use the TL1 **`ed-vrtsw`** command or select the **Configuration** → **Data** → **Provision Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click **Select**. Highlight and Select the Available AID d1-v3 to move the **VCG (WAN) Port** d1-v3 to the Selected AID column. Click **Apply**, then click **Close** to exit.

16 ESTABLISH HAIRPIN CROSS-CONNECTIONS

Determine the necessary **2-Way Hairpin** STS-1 cross-connections to be made between the FE circuit pack and the GbE circuit pack.

Note that the **2-Way Hairpin** cross-connections between the FE and GbE in this example must be made between the FE and GbE v3(v4) since the GbE VCG group v1 and v2 are part of the multipoint packet ring cross-connection.

17 Use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard to provision the **2-Way Hairpin** cross-connections. For example, see Figure 11-20, "FE to GbE Ethernet hairpin cross-connections and provisioning on packet ring" (p. 11-169).

Reference: Refer to Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204) for cross-connection examples.

18 From the System View menu, select **View** → **Cross-Connections** to verify that the proper connections have been made.

19 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

20 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

21 If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

22 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

23 Click on the **VCG Data** tab. Under the **Fault** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 24.

- If the VCG Monitoring Mode is **Not Monitored**,
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **Auto** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 21.
- If the VCG Monitoring Mode is **AUTO**:
  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

– Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

– If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

24 ASSIGN VLAN IDs TO ESTABLISH SERVICE

Use the TL1 **`ent-vlan`** command to assign the default VLAN ID for customer untagged frames or the customer VLAN ID for tagged frames to the associated LAN ports and VCG WAN ports on the FE and GbE circuit packs. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. For example, see Figure 11-20, "FE to GbE Ethernet hairpin cross-connections and provisioning on packet ring" (p. 11-169).

25 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the Ethernet circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

26 PROVISION VCGS

Use the **`ed-vcg`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the Ethernet circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Important! Enable full rate end-to-end flow control for the VCGs involved in the hairpin cross-connection by setting **Pause Control (psctl)** to **TRANSPARENT** for the VCGs involved in the hairpin cross-connection. In this example you would set Pause Control to **TRANSPARENT** for VCG c1-v1 on the FE circuit pack, and for VCG d1-v3 on the GbE circuit pack.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-19 Ethernet packet ring on a UPSR

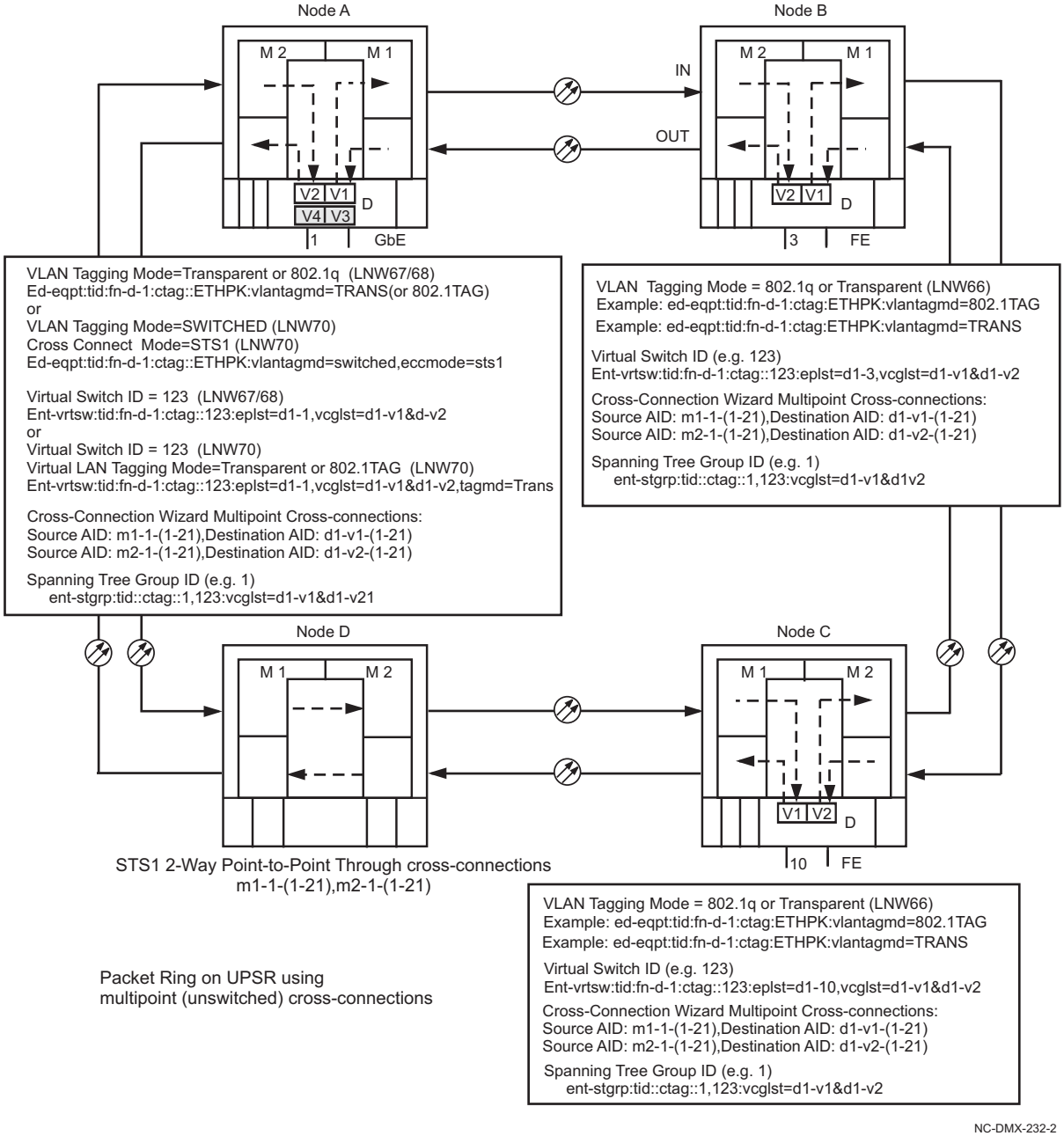
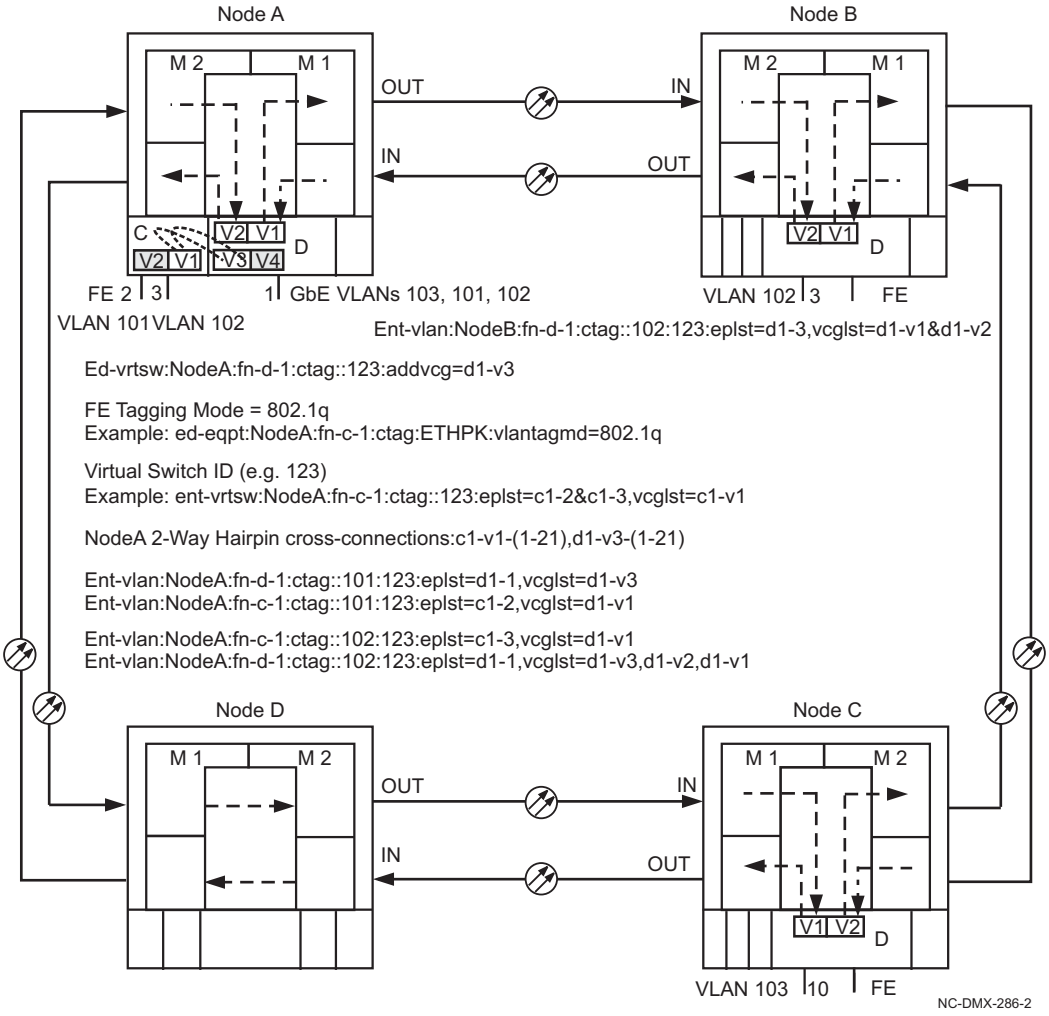


Figure 11-20 FE to GbE Ethernet hairpin cross-connections and provisioning on packet ring



Procedure 11-21: Establish LNW71 10/100-PL Fast Ethernet private line service on UPSR

Overview

This procedure provides examples for:

- Configuring point-to-point UPSR protected fast Ethernet private line service using the LNW71 10/100-PL Private Line Ethernet circuit pack. See Figure 11-21, "Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, one STS1" (p. 11-174), Figure 11-22, "Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, two STS1s" (p. 11-175), and Figure 11-23, "Two point-to-point 10/100-PL private line services, STS3c cross-connect mode, one STS1 service and one STS3c service" (p. 11-176) for examples.
  - Figure 11-21, "Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, one STS1" (p. 11-174) illustrates a UPSR protected point-to-point private line service using STS1 cross-connect mode and one STS1 cross-connection.
  - Figure 11-22, "Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, two STS1s" (p. 11-175) illustrates a UPSR protected point-to-point private line service using STS1 cross-connect mode and two STS1 cross-connection.
  - Figure 11-23, "Two point-to-point 10/100-PL private line services, STS3c cross-connect mode, one STS1 service and one STS3c service" (p. 11-176) illustrates two UPSR protected point-to-point private line services from one node to two other nodes using STS3c cross-connect mode and one STS1 cross-connection for one service and an STS-3c cross-connection for the other service.
- Configuring unprotected (no SONET protection) private line services with multipoint cross-connections, external customer equipment protection. See Figure 11-24, "Unprotected 10/100-PL private line services using multipoint cross-connections, STS1 cross-connect mode, external customer protected" (p. 11-177) for an example.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! If the LNW71 10/100-PL circuit pack is being used in Function groups A, B, or C and the Main slots are equipped with LNW26B OC-48 OLIUs or functionally equivalent OLIUs with PWDM compatible optics, then cross-connections may only be made to the first 12 VCGs in STS-1 mode or the first 8 VCGs in STS-3c mode.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.

Steps

Use this procedure as an example for configuring fast Ethernet private line service. See Figures for examples.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit group (A, B, C, or D) at each NE providing Ethernet service.

Reference: Procedure 4-12: "Install 10/100 Ethernet circuit packs" (p. 4-61)

6 **Important!** If the Ethernet circuit pack is already in service, the existing cross-connect mode cannot be changed without removing all existing VCG cross-connections.

CONFIGURE CROSS-CONNECT MODE

Determine the existing Cross-Connect mode for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the Cross-Connect mode.

7 If required, use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

8 Verify/Select the Cross-Connect mode (STS1 or STS3c) in the **Cross-Connect Mode** box. Click **Apply**, then click **Close** to exit.

9 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! STS-1 Cross-Connect mode supports one *or* two STS-1 cross-connections to each of 24 VCGs (1-24). STS-3c Cross-Connect mode supports at most one STS-3c *or* one STS-1 cross-connection to each of the first 16 VCGs (1-16), (VCGs 17-24 are not used).

In STS3c mode, if an STS1 cross-connection is made to a VCG, it *must* be made to the first (1) STS1 tributary of the VCG. In STS1 mode, the first STS1 cross-connection made to a VCG *should* be made to the first (1) STS1 tributary of the VCG (for example, d-v13-1).

10 One at a time at each *non* terminating node in the network, use the TL1 **`ent-crs-sts1`** or **`ent-crs-sts3c`** command to provision the pass-through cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

11 One at a time at each terminating node in the network, use the TL1 **`ent-crs-sts1`** or **`ent-crs-sts3c`** command to provision the add/drop cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

12 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

13 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

14 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

16 Click **Apply**. Read the warning message, then click **Yes** to execute the command.

17 PROVISION VCGS

Use the **`ed-vcg`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the prevision step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: “Provision Ethernet VCG parameters” (p. 11-89)

18 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit or repeat from Step 15 for other port provisioning.

END OF STEPS

Figure 11-21 Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, one STS1

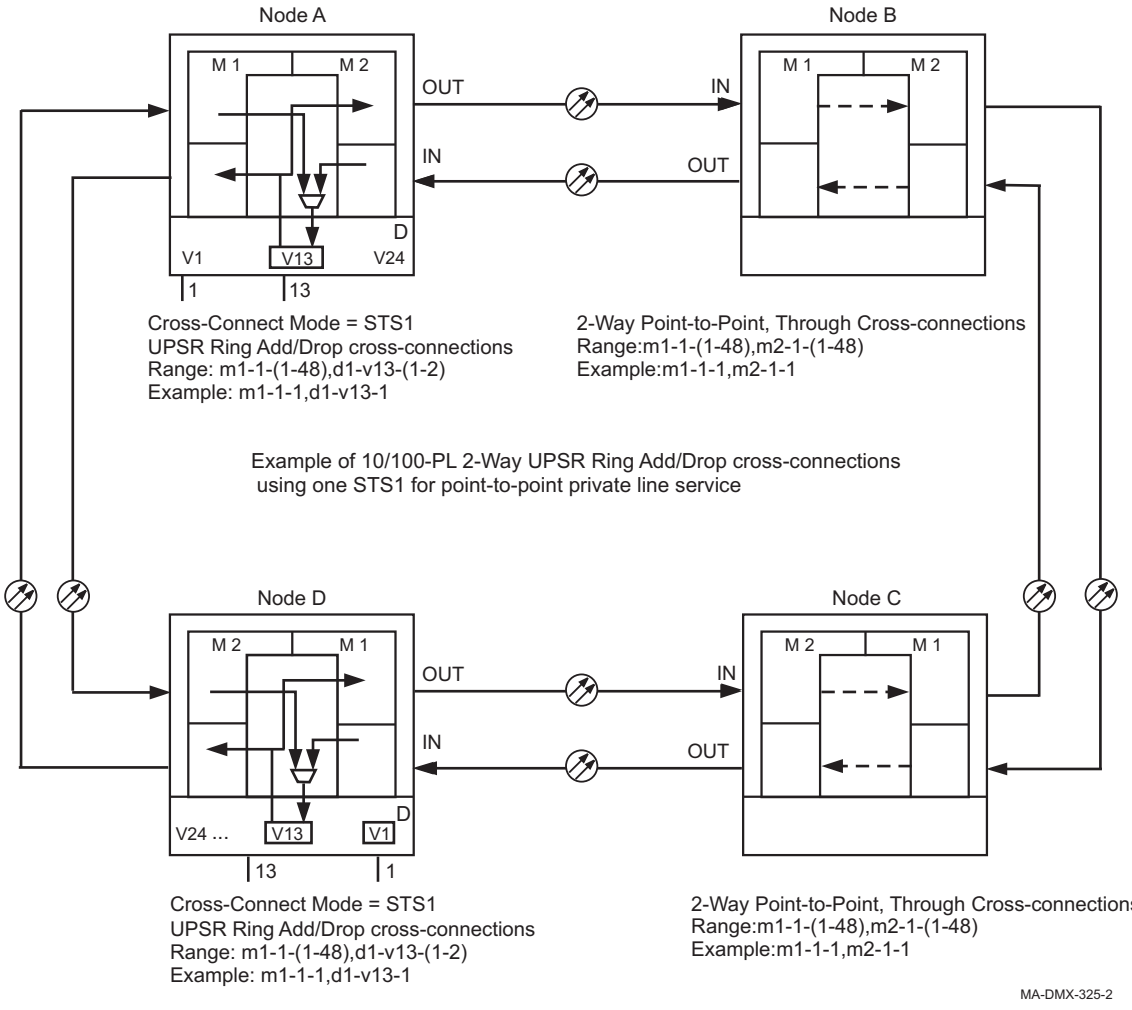


Figure 11-22 Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, two STS1s

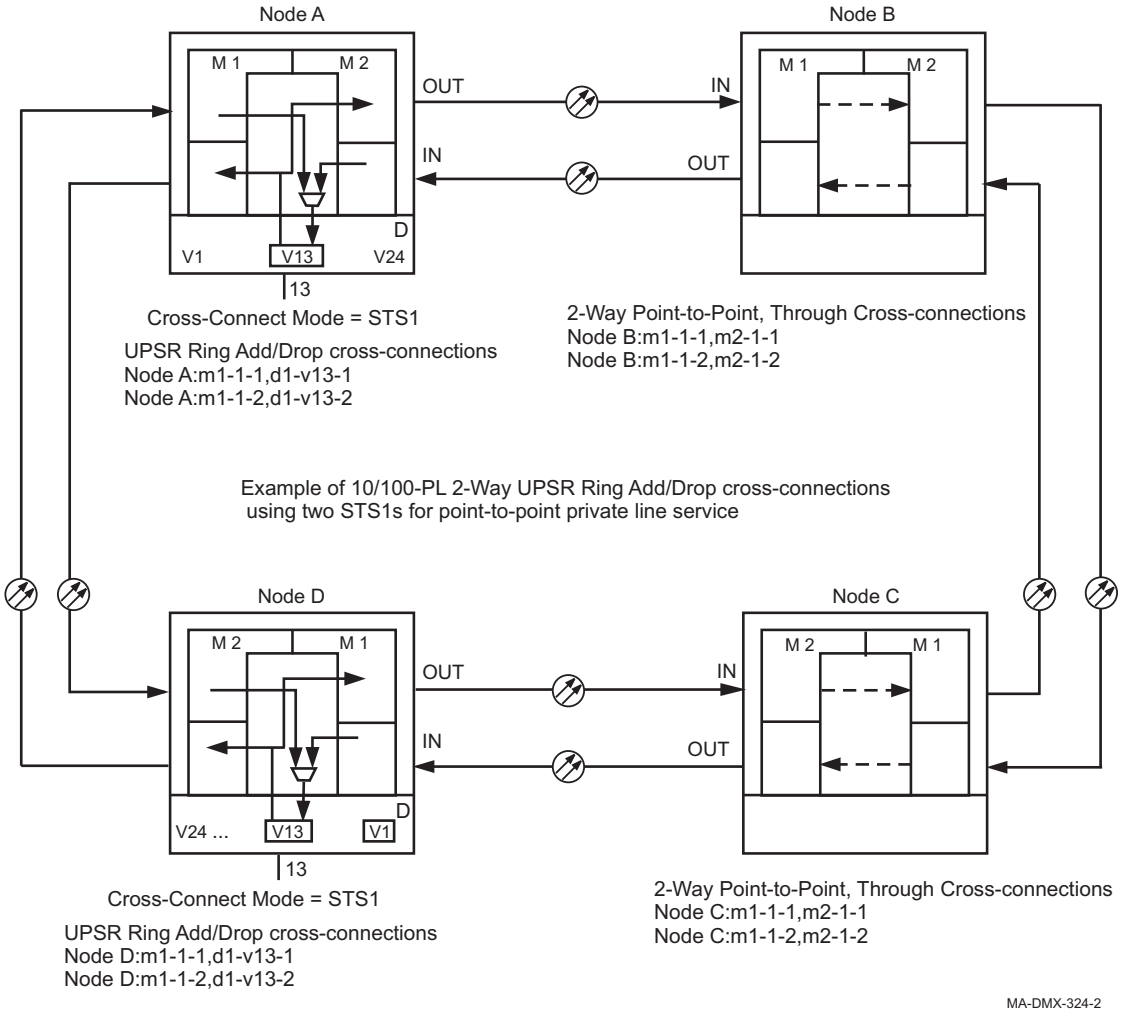


Figure 11-23 Two point-to-point 10/100-PL private line services, STS3c cross-connect mode, one STS1 service and one STS3c service

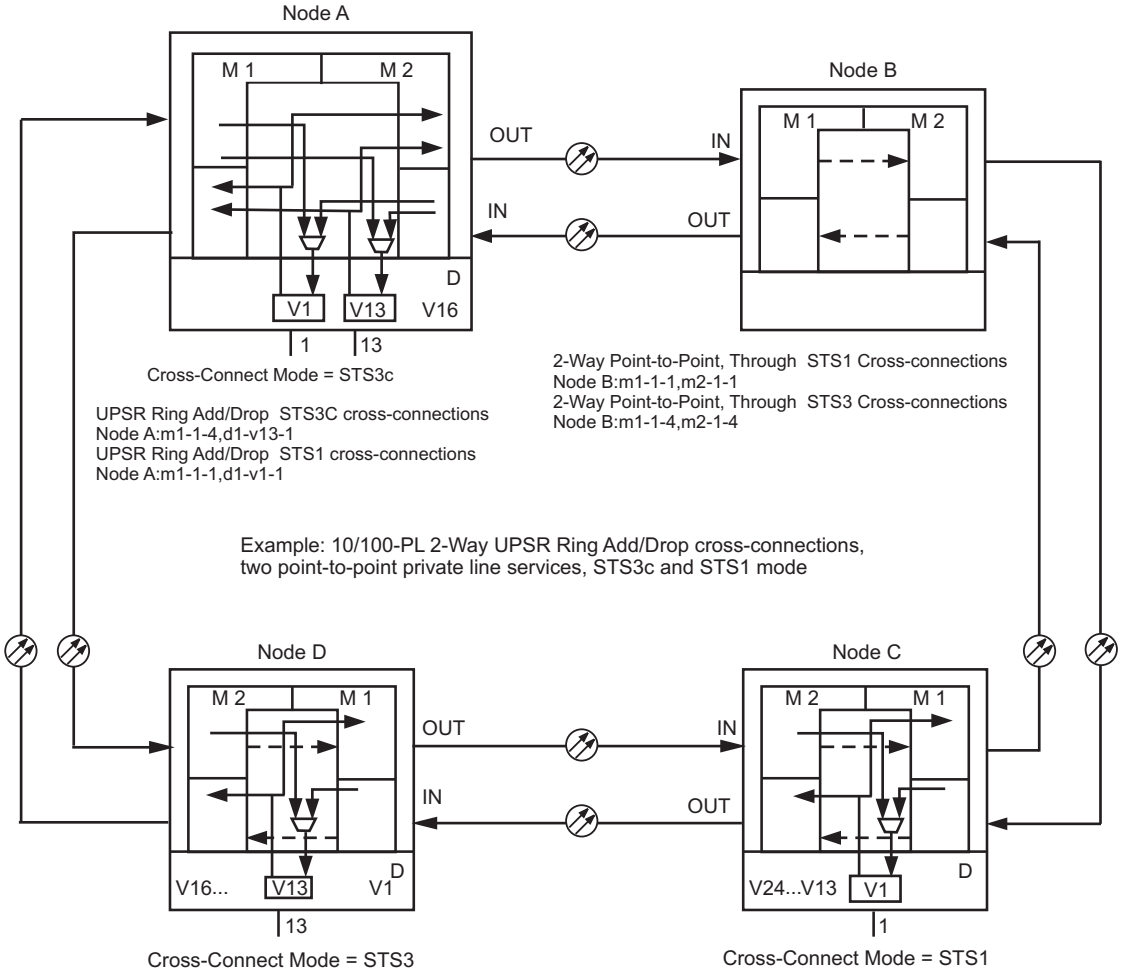
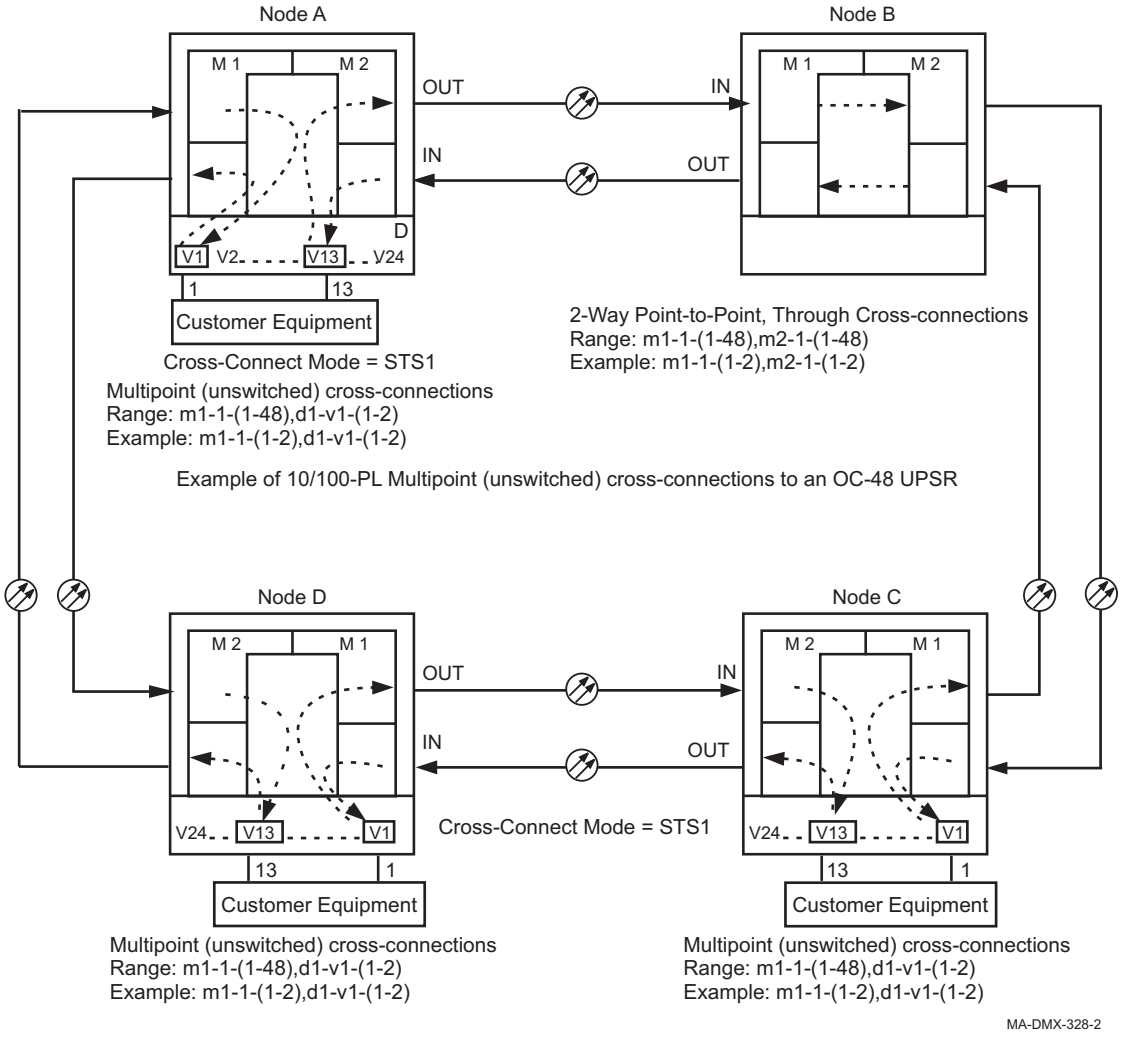


Figure 11-24 Unprotected 10/100-PL private line services using multipoint cross-connections, STS1 cross-connect mode, external customer protected



Procedure 11-22: Establish video broadcast network on UPSR

Overview

This procedure provides an example for configuring a video broadcast network with a bidirectional control channel on a UPSR ring using Gigabit Ethernet circuit packs and 802.1q tagging mode.

The control ring is optional and only needed if control data needs to be sent to/from the remote sites.

Frames sent from the head end source node must be Multicast frames.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters.

This procedure consists of essentially three parts:

- The first part verifies the network and sets the tagging mode and other parameters for the Ethernet packs being used.
- The second part establishes the downstream video broadcast ring.
- The third part establishes a multipoint packet ring for upstream control functions.

Refer to Figure 11-25, "Provisioning Ethernet nodes for video broadcast ring" (p. 11-190) and Figure 11-26, "Provisioning cross-connections for video broadcast ring" (p. 11-191) for provisioning the video broadcast ring. Refer to Figure 11-27, "Provisioning Ethernet nodes for control packet ring" (p. 11-192) and Figure 11-28, "Provisioning cross-connections for control packet ring" (p. 11-193) for provisioning the control packet ring.

This procedure assumes that the UPSR SONET ring network configuration has already been established and no alarms are present.

> **Important!** On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (this procedure uses 802.1q), virtual switch IDs, and spanning tree groups to be created at each node.
- The VLAN IDs being assigned to the video broadcast traffic and to the control traffic.

  Important! This procedure is typically performed at full rate Gigabit service; full rate Gigabit service requires 21 STS-1 or equivalent cross-connections. Ensure that you have a sufficient number of STS-1s available.

Steps

Use this procedure as an example for configuring a video broadcast network with upstream control functions.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

  Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

  Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

  This command may take several minutes to complete depending on the size of the network.

  Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, WAN (VCG) ports, virtual switch ID, cross-connections, spanning tree group ID, and VLAN IDs associated with the service being established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 *CONFIGURE TAGGING MODE*

At each NE providing this Ethernet service, determine the existing tagging mode for the Ethernet circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW66/67/68 circuit packs must be set to **`TRANS`** or **`802.1TAG`**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

Important! When GbE circuit packs are installed in the shelf, the default "NOTAG" mode is assigned to the circuit pack.

7

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 13.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **`rtrv-vrtsw`** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

9 

NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

If a virtual switch is assigned, use the TL1 **`dlt-vrtsw`** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click Select. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

10 Provision circuit pack parameters. Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

11 Verify/Select the tagging mode (**`802.1TAG`**, **`TRANS`**, or **`SWITCHED`**) in the VLAN Tagging Mode box.

Important! This procedure uses 802.1TAG mode to illustrate the provisioning.

12 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval** [LNW66/67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: “Provision Ethernet circuit pack parameters” (p. 11-103)

END OF STEPS TO PROVISION CIRCUIT PACKS

13 *BEGIN VIDEO BROADCAST RING PROVISIONING*

See Figure 11-25, “Provisioning Ethernet nodes for video broadcast ring” (p. 11-190).

Assign Virtual Switch ID:

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**). This procedure uses 802.1TAG mode to illustrate the provisioning.
- For circuit packs in service, on only one set of ports, with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

For the video broadcast ring in this example, note that we assigned a virtual switch ID of 4095 to LAN port d1-1 and VCG port d1-v1 at each participating node. See Figure 11-25, “Provisioning Ethernet nodes for video broadcast ring” (p. 11-190).

14 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at the head end node, each Ethernet terminating node, and any pass through cross-connections to be made at any *non* terminating nodes in the network. See Figure 11-26, “Provisioning cross-connections for video broadcast ring” (p. 11-191) for an example.

15 One at a time at each node in the network, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Select **Create a new Cross-Connections**, then click **Next** at the bottom of the screen.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204).

16 Use the Cross-Connection Wizard at each *non* terminating node to provision the two-way pass-through (**2-Way Point-to-Point, Through**) cross-connections.

17 Use the Cross-Connection Wizard at the head end source node to provision the Ethernet one-way add (**1-Way Point-to-Point**) cross-connections.

18 Use the Cross-Connection Wizard at the remote terminating nodes to provision the one-way path protected drop (**1-Way Path Protected Drop from a UPSR Ring**) and two-way pass-through (**2-Way Point-to-Point, Through**) cross-connections.

19 From the System View menu, select **View** → **Cross-Connections** to verify that the proper cross-connections have been made.

20 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in the Input or Ouput Direction, as required.

If not already performed when cross-connections were made, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**`inmbs`**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**`outmbs`**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

21 After all cross-connections are made at each node in the ring, click on the **Alarm List** button on the System View window and verify no new alarms are present.

22 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 *VERIFY PORT MONITORING MODE*

After all cross-connections have been made at each node in the ring, verify that the WAN (VCG) Ports being used have gone in service (IS) at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Important! Note that the VCG port at the head end source node will not show in-service since it is not provisioned to receive packets.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

24 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

25 Click on the **Fault/Alarms** tab. Verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, click **Close** to exit then proceed to Step 26.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **Fault/Alarms** tab, select **AUTO** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 23.
- If the VCG Monitoring Mode is **AUTO**:
  Verify that the VCG Trib Membership provisioning is correct. Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

If proper cross-connections have been made, then indications are that either the far end or near end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

– Log in to the NE at the far end of the span that connects to the near end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near end circuit pack and check the VCG Monitoring Mode.

– If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far end and near end circuit packs.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

26 ASSIGN VLAN IDs TO VIDEO BROADCAST RING NETWORK

Use the TL1 **`ent-vlan`** command to assign the VLAN ID for the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. For example, see Figure 11-25, “Provisioning Ethernet nodes for video broadcast ring” (p. 11-190).

In this example, we assign VLAN 2567 to the associated LAN (d1-1) and VCG (d1-v1) ports at the head end and terminating nodes.

27 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN Port (for example, Port 1), then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

28 PROVISION VCGS

Use the **`ed-vcg`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS TO PROVISION VIDEO BROADCAST RING

29



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

BEGIN CONTROL PACKET RING PROVISIONING

See Figure 11-27, "Provisioning Ethernet nodes for control packet ring" (p. 11-192).

Assign Virtual Switch ID:

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **`ent-vrtsw`** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **`dlt-vrtsw`** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.
- For circuit packs in service, on only one set of ports, with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

  For the control packet ring in this example, note that we assigned a virtual switch ID of 250 to LAN port d1-2 and VCG ports d1-v3 and d1-v4 at each participating node. See Figure 11-27, "Provisioning Ethernet nodes for control packet ring" (p. 11-192).

30 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary Multipoint (unswitched) cross-connections to be made at each Ethernet terminating node and any two-way pass-through cross-connections to be made at any *non* terminating nodes in the network. See Figure 11-28, "Provisioning cross-connections for control packet ring" (p. 11-193) for an example.

31 One at a time at each node in the network, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Select **Create a new cross-connection**, then click **Next** at the bottom of the screen.

Reference: Refer to Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204) for cross-connection examples.

32 Use the Cross-Connection Wizard at each *non* terminating node to provision the two-way pass-through (**2-Way Point-to-Point, Through**) cross-connections.

33 Use the Cross-Connection Wizard at each terminating node to provision the Ethernet **Multipoint** (unswitched) cross-connections.

34 From the System View menu, select **View** → **Cross-Connections** to verify that the proper cross-connections have been made.

35 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no new alarms are present.

36 If new alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

37 If required, after all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

38 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

39 Click on the **Fault/Alarms** tab. Verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, click **Close** to exit then proceed to Step 40.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **Fault/Alarms** tab, select **AUTO** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 37.
- If the VCG Monitoring Mode is **AUTO**:
  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.
  If proper cross-connections have been made, then indications are that either the far end or near end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*
  – Log in to the NE at the far end of the span that connects to the near end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Select**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near end circuit pack and check the VCG Monitoring Mode.
  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far end and near end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

40 CREATE SPANNING TREE GROUP

If required, determine a preferred spanning tree configuration (span to be blocked under nominal conditions), the preferred root node, and spanning tree root priorities for this service.

Important! Note that it is not necessary to determine a preferred spanning tree configuration. A default spanning tree configuration is configured when you establish the spanning tree group.

Reference: Procedure 11-25: "Create preferred spanning tree configuration" (p. 11-224)

41 At each Ethernet node, use the TL1 command **`ent-stgrp`** to assign and provision the parameters for the ports (d1-v3 and d1-v4 in this example) involved in the spanning tree group. Or, select **Configuration** → **Data** → **Create Spanning Tree Group** command from the CIT System View menu. For example, see Figure 11-27, "Provisioning Ethernet nodes for control packet ring" (p. 11-192).

Important! Networks running 802.1d STP (Release 1.1) support a maximum of up to nine nodes participating in a spanning tree. Networks with more than nine nodes will not reconfigure properly. Spanning tree default parameters support a network of up to nine nodes.

Networks running 802.1w rapid spanning tree protocol (Release 2 or later) support more than nine nodes participating in a spanning tree. To support more than nine nodes in the spanning tree, the maximum age timer must be increased. Note that spanning tree restoration time increases as the number of nodes increase.

If the network consists of more than nine (9) nodes which are participating in the spanning tree configuration, use the following formula to determine the proper setting for the spanning tree maximum age timer (**`stmaxage`**): 2N + 6, where N equals the number of nodes.

For example, if the network consists of 20 nodes, then the **`stmaxage`** timer should be set to 46 seconds: 2 x (20) + 6= 46.

42 ASSIGN VLAN IDs TO CONTROL RING NETWORK

Use the TL1 **`ent-vlan`** command to assign the VLAN ID for the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. For example, see Figure 11-27, "Provisioning Ethernet nodes for control packet ring" (p. 11-192).

In this example, we assign VLAN 4093 to the associated LAN (d1-2) and VCGs (d1-v3 and d1-v4) ports at each node.

43 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

44 PROVISION VCGS

Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: “Provision Ethernet VCG parameters” (p. 11-89)

END OF STEPS

Figure 11-25 Provisioning Ethernet nodes for video broadcast ring

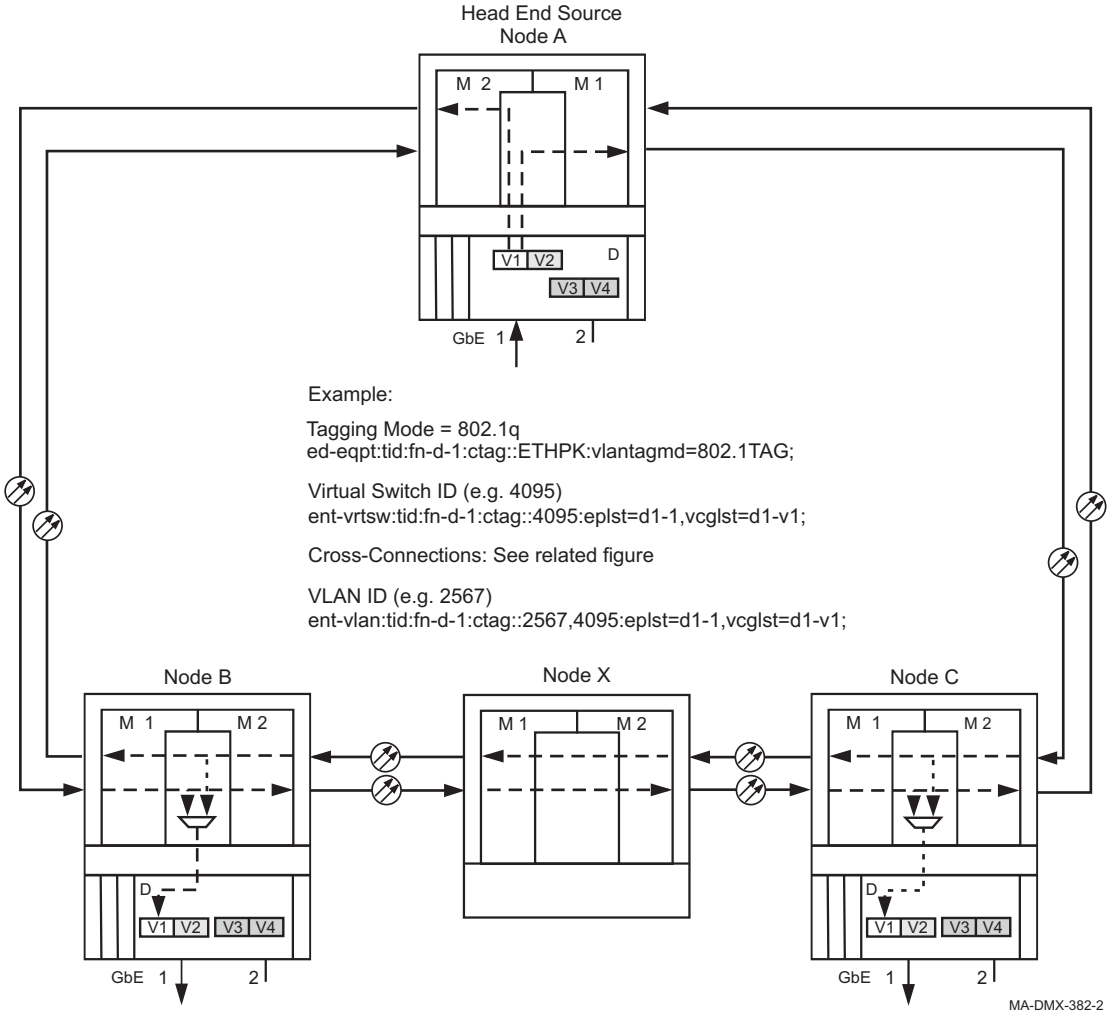
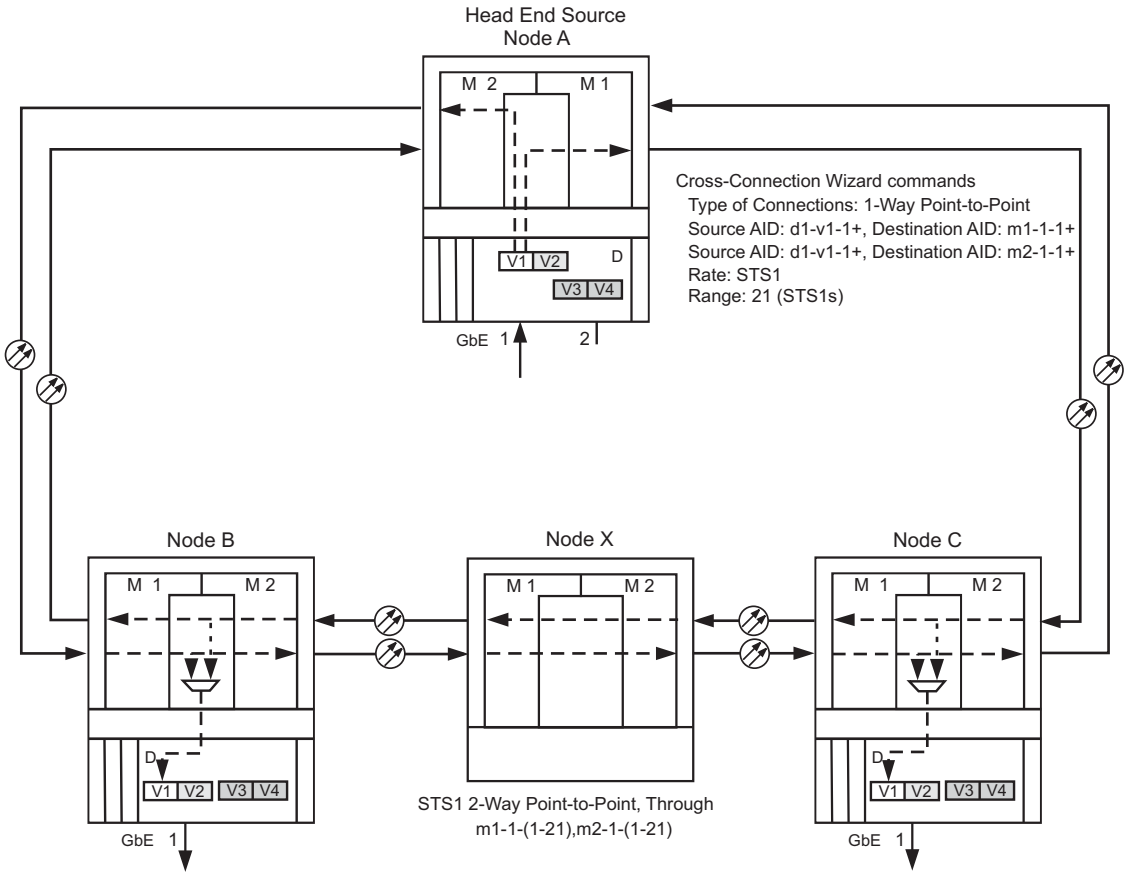


Figure 11-26 Provisioning cross-connections for video broadcast ring



Cross-connections at Nodes B and C

Cross-Connection Wizard commands
Type of Cross-connection: 1-Way Path Protected Drop from a UPSR Ring
Source AID: m1-1-1+, Destination AID: d1-v1-1+
Rate: STS1
Range: 21 (STS1s)

Type of Cross-connection: 2-Way Point-to-Point, Through
Source AID: m1-1-1+, Destination AID: m2-1-1+
Rate: STS1
Range: 21 (STS1s)

MA-DMX-383-2

Figure 11-27 Provisioning Ethernet nodes for control packet ring

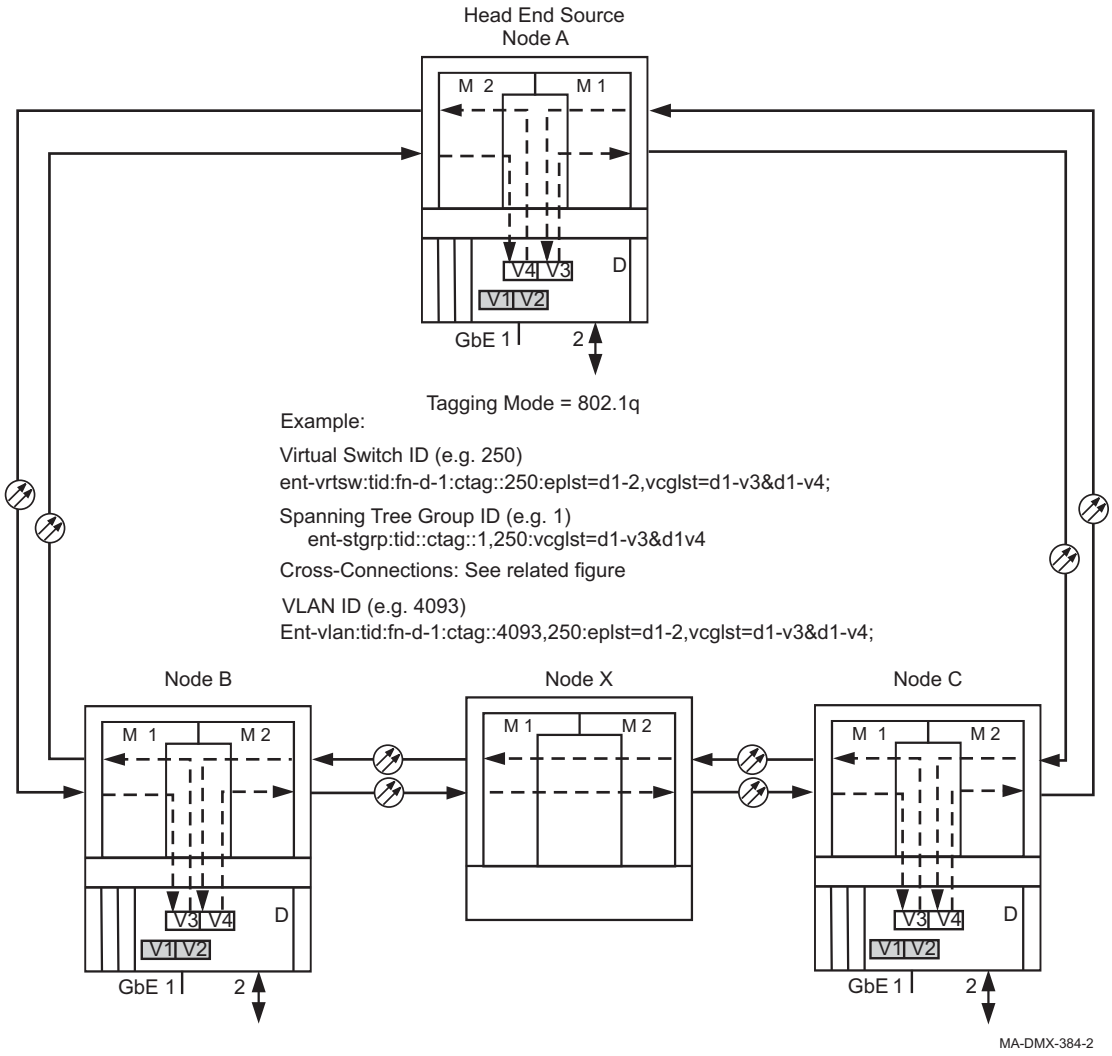
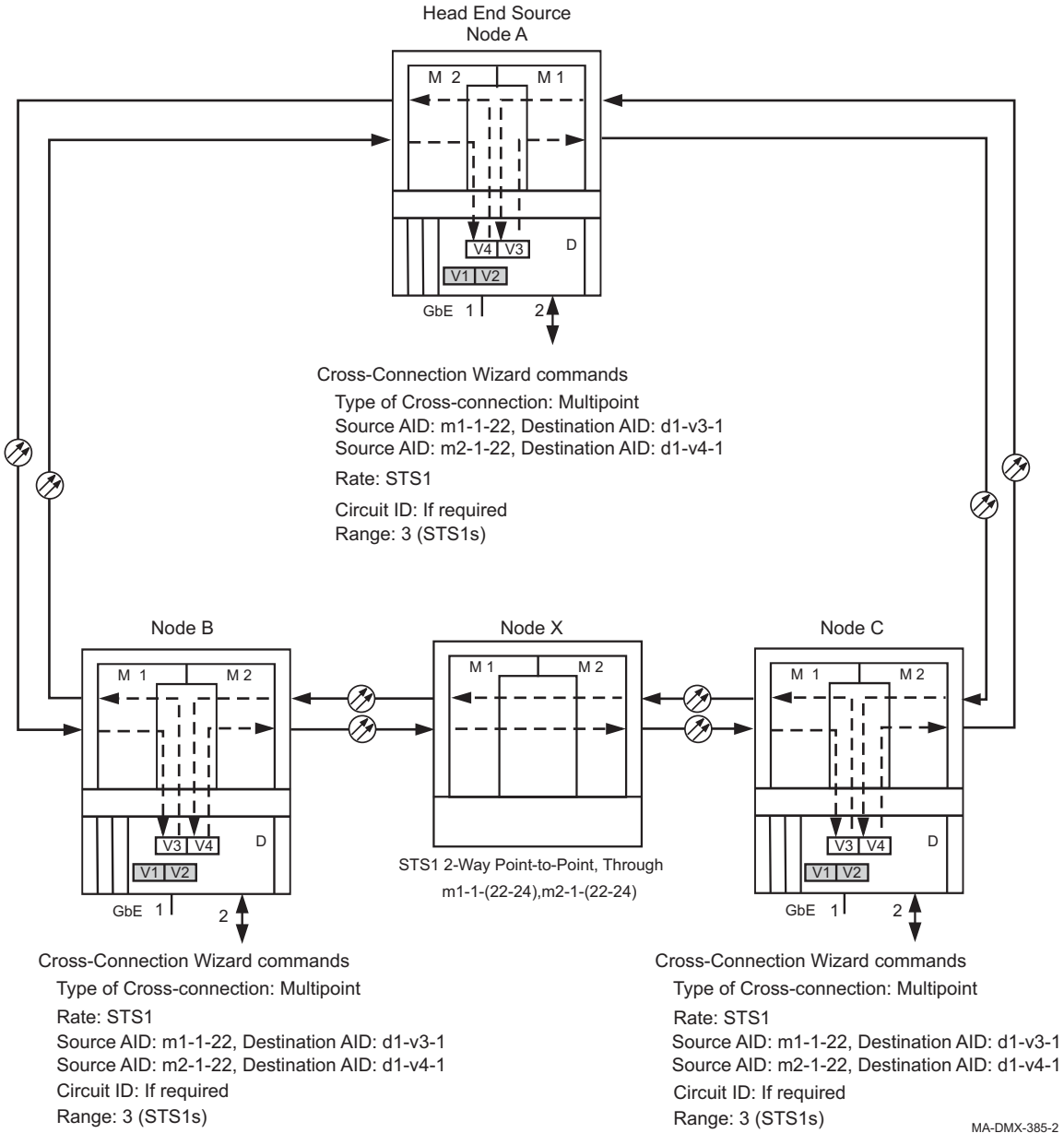


Figure 11-28 Provisioning cross-connections for control packet ring



Procedure 11-23: Establish video broadcast network on BLSR

Overview

This procedure provides an example for configuring a video broadcast network BLSR ring using Gigabit Ethernet circuit packs and 802.1q tagging mode.

Frames sent from the head end source node must be Multicast frames.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters.

This procedure consists of essentially two parts:

- The first part verifies the network and sets the tagging mode and other parameters for the Ethernet packs being used.
- The second part establishes the downstream video broadcast ring.

Refer to Figure 11-29, "Provisioning Ethernet nodes for video broadcast ring" (p. 11-202) and Figure 11-30, "Provisioning cross-connections for video broadcast ring" (p. 11-203) for provisioning the video broadcast ring.

This procedure assumes that the BLSR SONET ring network configuration has already been established and no alarms are present.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.
- The tagging mode (this procedure uses 802.1q), virtual switch IDs, and spanning tree groups to be created at each node.
- The VLAN IDs being assigned to the video broadcast traffic.

Steps

Use this procedure as an example for configuring a video broadcast network on a BLSR ring.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **View** → **Rings** → **Ring Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *View Ring Map* window opens.

3 Expand ring details, **Select** the **2F BLSR** ring, then verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, WAN (VCG) ports, virtual switch ID, cross-connections, spanning tree group ID, and VLAN IDs associated with the service being established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 *CONFIGURE TAGGING MODE*

At each NE providing this Ethernet service, determine the existing tagging mode for the Ethernet circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW66/67/68 circuit packs must be set to **TRANS** or **802.1TAG**. The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **SWITCHED**.

Important! When GbE circuit packs are installed in the shelf, the default "NOTAG" mode is assigned to the circuit pack.

7

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 13.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 If you are going to change the VLAN Tagging Mode that presently exists AND a virtual switch ID already exists, you must delete the existing virtual switch ID before changing the tagging mode.

Determine if a virtual switch ID has already been assigned to the LAN/WAN ports used for this service. Use the TL1 **rtrv-vrtsw** command or select the **View** → **Data** → **Virtual Switch** command from the System View menu, select the GbE circuit pack being provisioned, then click **Select**. Note if a virtual switch ID has been assigned.

9



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing GbE circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

If a virtual switch is assigned, use the TL1 **dlt-vrtsw** command or select the **Configuration** → **Data** → **Delete Virtual Switch** command from the System View menu, select the circuit pack being provisioned, then click Select. Highlight the VRTSW ID being deleted, then click **Apply**.

Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

10 Provision circuit pack parameters. Use the TL1 **ed-eqpt** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

11 Verify/Select the tagging mode (**802.1TAG**, **TRANS** [LNW66,67,68], or **SWITCHED** [LNW70/LNW170]) in the VLAN Tagging Mode box.

Important! This procedure uses 802.1TAG mode to illustrate the provisioning.

12 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval** [LNW66/67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

END OF STEPS TO PROVISION CIRCUIT PACKS

13 *BEGIN VIDEO BROADCAST RING PROVISIONING*

See Figure 11-29, "Provisioning Ethernet nodes for video broadcast ring" (p. 11-202).

Assign Virtual Switch ID:

- For circuit packs not yet in service with no virtual switch assigned:
  - Use the TL1 **ent-vrtsw** command to create an assigned virtual switch ID or select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).
- For circuit packs not yet in service with a virtual switch assigned:
  - Use the TL1 **dlt-vrtsw** command to delete an assigned virtual switch ID or select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu, if a different virtual switch ID is required.
  - Use the TL1 command **ent-vrtsw** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the selected LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

- For circuit packs in service, on only one set of ports, with a virtual switch assigned:
  - Use the TL1 **`ed-vrtsw`** command or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu to remove the required ports from a virtual switch.
  - Use the TL1 command **`ent-vrtsw`** command or select **Configuration** → **Data** → **Create Virtual Switch** to create a new virtual switch ID containing the required LAN/WAN ports.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

For the video broadcast ring in this example, note that we assigned a virtual switch ID of 4095 to LAN port d1-1 and VCG port d1-v1 at each participating node. See Figure 11-29, "Provisioning Ethernet nodes for video broadcast ring" (p. 11-202).

14 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary one-way (**1-Way Point-to-Point**) cross-connections to be made at the head end node, each Ethernet terminating node, and any one-way pass through (**1-Way Point-to-Point, Through**) cross-connections to be made at any *non* terminating nodes in the network. See Figure 11-30, "Provisioning cross-connections for video broadcast ring" (p. 11-203) for an example.

15 One at a time at each node in the network, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Select **Create a new cross-connection**, then click **Next** at the bottom of the screen.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204).

16 Use the Cross-Connection Wizard at each *non* terminating node to provision the one-way pass-through (**1-Way Point-to-Point, Through**) cross-connections.

17 Use the Cross-Connection Wizard at the head end source node to provision the Ethernet one-way add (**1-Way Point-to-Point**) cross-connections.

18 Use the Cross-Connection Wizard at the remote terminating nodes to provision the one-way drop (**1-Way Point-to-Point**) and one-way pass-through (**1-Way Point-to-Point, Through**) cross-connections.

19 From the System View menu, select **View** → **Cross-Connections** to verify that the proper cross-connections have been made.

20 **Important!** For LNW70/LNW170 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in the Input or Ouput Direction, as required.

If not already performed when cross-connections were made, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**`inmbs`**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**`outmbs`**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: “Provision LCAS, add/enable/remove tributaries” (p. 11-260)

21 After all cross-connections are made at each node in the ring, click on the **Alarm List** button on the System View window and verify no new alarms are present.

22 If new alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 *VERIFY PORT MONITORING MODE*

After all cross-connections have been made at each node in the ring, verify that the WAN (VCG) Ports being used have gone in service (IS) at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Important! Note that the VCG port at the head end source node will not show in-service since it is not provisioned to receive packets.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

24 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

25 Click on the **Fault/Alarms** tab. Verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, click **Close** to exit then proceed to Step 26.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  Perform the following:
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **Fault/Alarms** tab, select **AUTO** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 23.
- If the VCG Monitoring Mode is **AUTO**:
  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.
  If proper cross-connections have been made, then indications are that either the far end or near end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*
  – Log in to the NE at the far end of the span that connects to the near end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near end circuit pack and check the VCG Monitoring Mode.
  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far end and near end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

26 ASSIGN VLAN IDs TO BROADCAST RING NETWORK

Use the TL1 **ent-vlan** command to assign the VLAN ID for the associated LAN ports and VCG WAN ports. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu.

Reference: For example, see Figure 11-29, "Provisioning Ethernet nodes for video broadcast ring" (p. 11-202).

In this example, we assign VLAN 2567 to the associated LAN (d1-1) and VCG (d1-v1) ports at the head end and terminating nodes.

27 PROVISION LAN PORTS

Use the TL1 **ed-eport** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN Port (for example, Port 1), then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

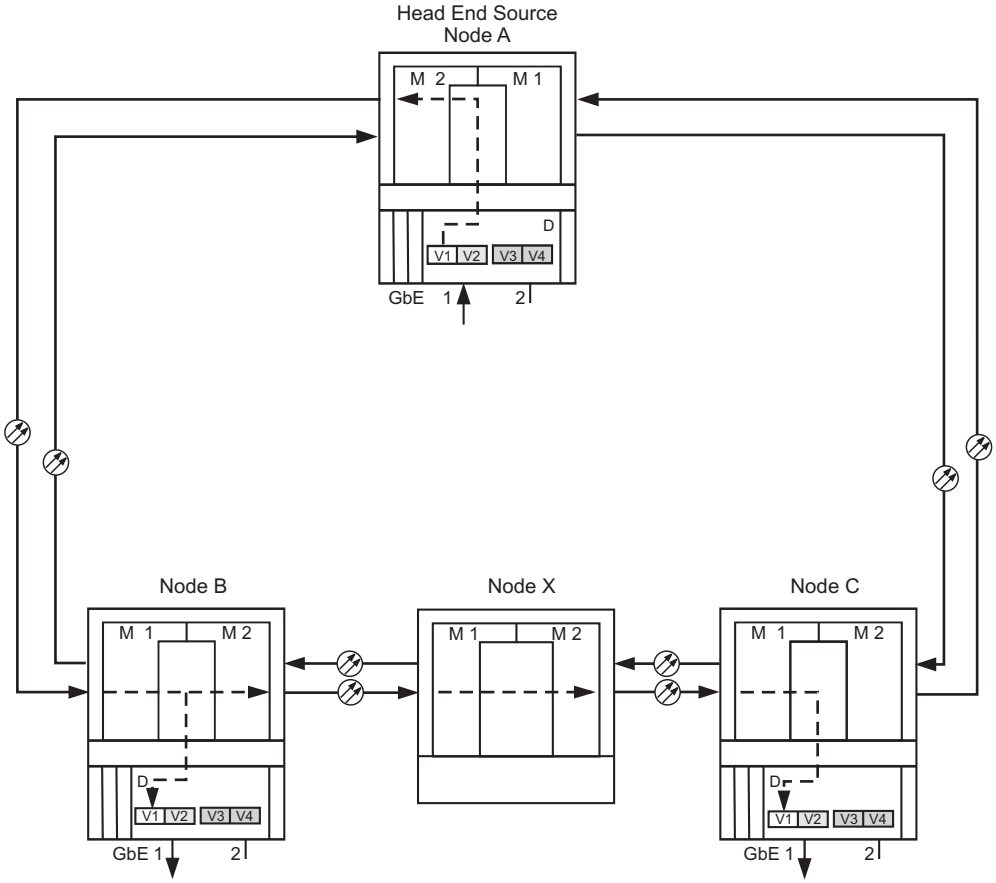
28 PROVISION VCGS

Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-29 Provisioning Ethernet nodes for video broadcast ring



Example provisioning Nodes A, B, and C:

Tagging Mode = 802.1q
ed-eqpt:tid:fn-d-1:ctag::ETHPK:vlantagmd=802.1TAG;
Configuration > Equipment

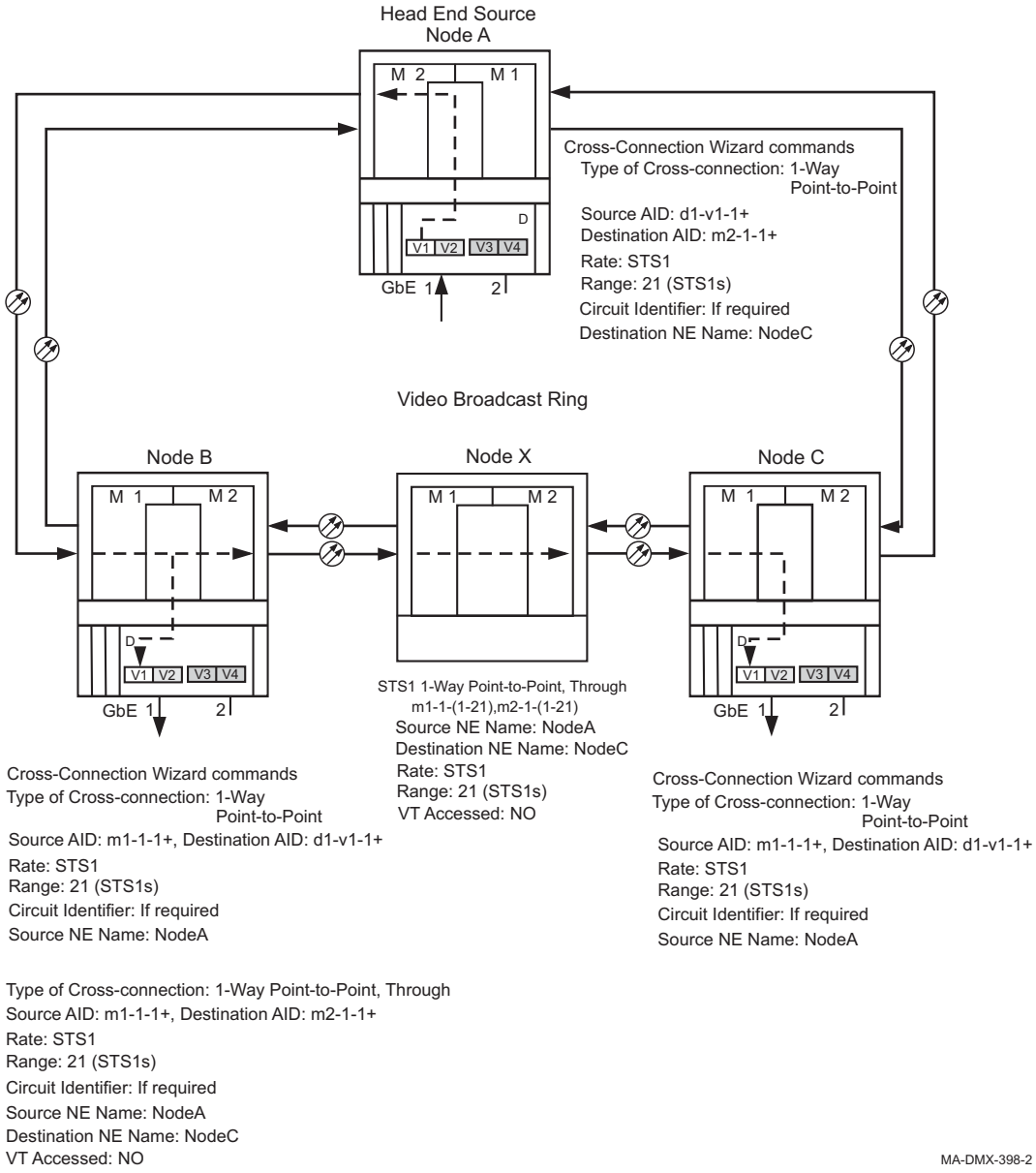
Virtual Switch ID (e.g. 4095)
ent-vrtsw:tid:fn-d-1:ctag::4095:eplst=d1-1,vcglst=d1-v1;
Configuration > Data > Create Virtual Switch

Cross-Connections: See related figure

VLAN ID (e.g. 2567)
ent-vlan:tid:fn-d-1:ctag::2567,4095:eplst=d1-1,vcglst=d1-v1;
Configuration > Data > Create VLAN

MA-DMX-397-2

Figure 11-30 Provisioning cross-connections for video broadcast ring



Procedure 11-24: Make cross-connections for Ethernet service

Overview

This procedure provides examples for making cross-connections for Ethernet service. The examples use the *WaveStar*® CIT Cross-Connection Wizard commands in most examples to illustrate the provisioning. Cross-connection provisioning using TL1 commands requires the use of multiple 1way, 1 waypr, and 1way unswitched cross-connections to make the appropriate cross-connections. Refer to the Alcatel-Lucent 1665 DMX Access Multiplexer TL1 Message Details, 365-372-306, regarding cross-connections using the **`ent-crs-rr`** command.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Steps

Use this procedure as an example for making cross-connections for Ethernet service.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

For BLSR rings, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the cross-connections to be made at each node associated with the service to be established.

The following figures illustrate the cross-connection rate, type, and STSn AID addresses when using the *WaveStar*® CIT Cross-Connection Wizard in the following steps.

- Figure 11-31, "UPSR Ring Add/Drop cross-connections" (p. 11-208) illustrates a path protected OC-48 ring network with UPSR Ring Add/Drop STS1 cross-connections for Ethernet service.
- Figure 11-32, "Multipoint mixed GbE and FE cross-connections on a UPSR" (p. 11-209) and Figure 11-33, "Multipoint GbE cross-connections on a UPSR" (p. 11-210) illustrate OC-48 ring networks with Multipoint (1way unswitched) STS1 cross-connections for Ethernet service.
- Figure 11-34, "SONET protected 2F BLSR Add/Drop cross-connections on a BLSR without NUT" (p. 11-211) illustrates a BLSR protected OC-48 ring network with 2F BLSR Add/Drop (1way) STS1 cross-connections for Ethernet service.
- Figure 11-35, "Multipoint (1way unswitched) cross-connections on a BLSR with NUT" (p. 11-212) illustrates a BLSR protected OC-48 ring network with Multipoint (1way unswitched) STS1 cross-connections using NUT for Ethernet service.
- Figure 11-36, "Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, One STS1" (p. 11-213) illustrates a Point-to-Point 10/100-PL Private Line Service, using STS1 Cross-Connect Mode with one STS1.
- Figure 11-37, "Multipoint 10/100-PL private line service, STS1 cross-connect mode, External Customer Protected" (p. 11-214) illustrates a 10/100-PL Private Line Service, using STS1 Cross-Connect Mode, Multipoint (1way unswitched) STS1 cross-connections, and protected by external customer equipment.
- Figure 11-38, "Two point-to-point 10/100-T/F private line services, STS3c and VT1.5" (p. 11-215) illustrates two Point-to-Point 10/100-T/F Private Line Services using STS3c and VT1.5 cross-connections.

5 Starting at one of the nodes in the ring for the circuit being established, select **View** → **Cross-Connections** at each node in the ring to verify that the cross-connections specified on the work instructions may be made.

If cross-connections are already assigned or improperly assigned, refer trouble to the provisioning organization. Improperly assigned cross-connections may have to be deleted, or a different timeslot must be selected for the service being selected.

6 One at a time, at each *non* terminating node, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at all *non* terminating nodes in the network to provision the 2-Way Point-to-Point, Through STSn pass-through cross-connections for the Ethernet service being provided.

Reference: "Cross-Connections for Ethernet " (p. 11-216)

7 One at a time, at each terminating node, select **Configuration** → **Cross-Connections** from the **System View** menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at all terminating nodes in the network to provision the STSn add/drop cross-connections.

Important! When multiple VCG tributaries are used to provide an Ethernet service, the VCG tributaries must be connected in the same order at both ends. See Reference.

Reference: "Cross-Connections for Ethernet " (p. 11-216)

8 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

9 **Important!** For LNW63/64/70/170/73/74/78/87 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in the Input or Ouput Direction, as required.

Use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

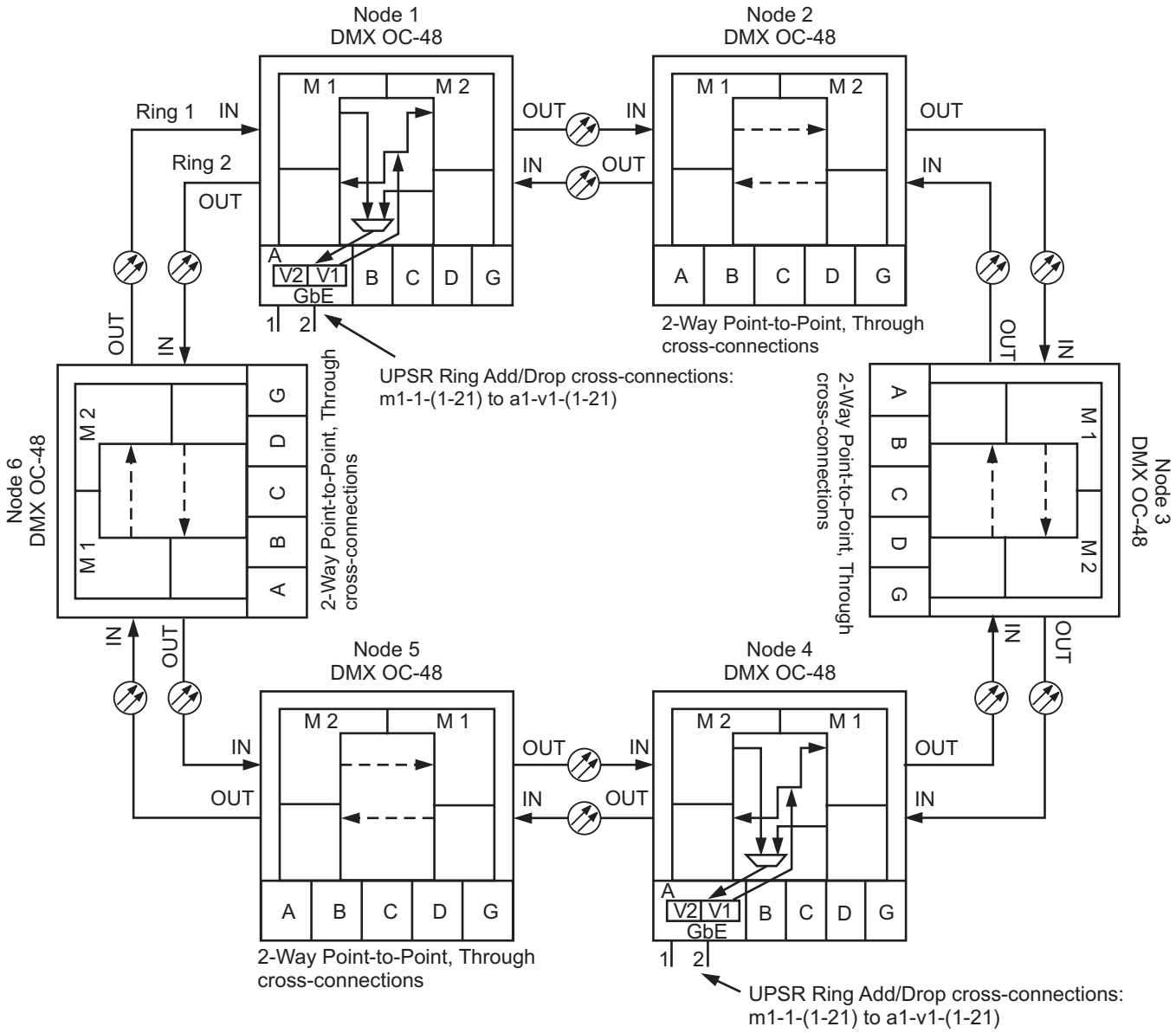
10 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

11 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Figure 11-31 UPSR Ring Add/Drop cross-connections

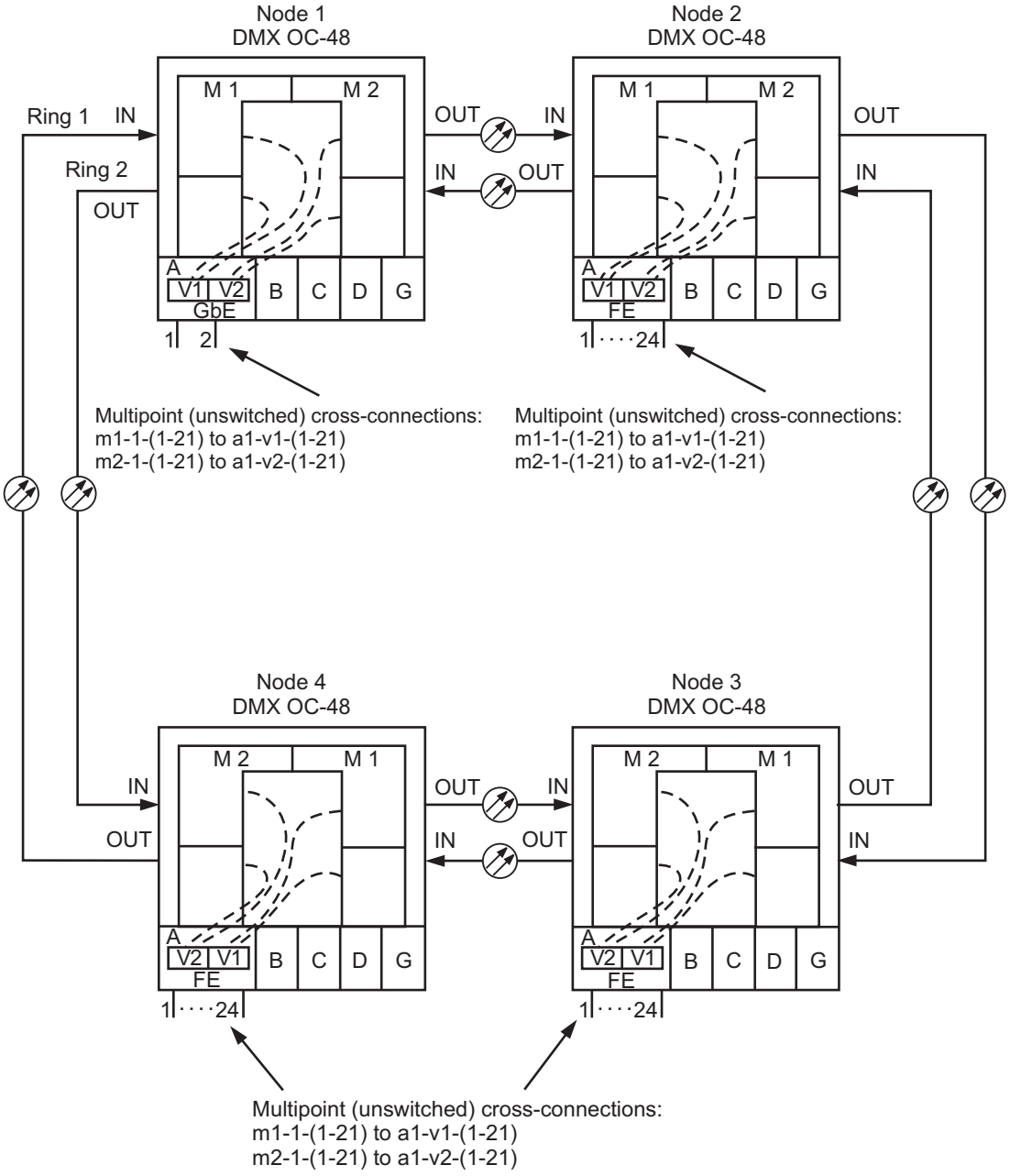


Example: Pass through cross-connections at Nodes 2,3,5, and 6:
m1-1-(1-21),m2-1-(1-21)

DMX = 1665 Data Multiplexer

NC-DMX-086-2

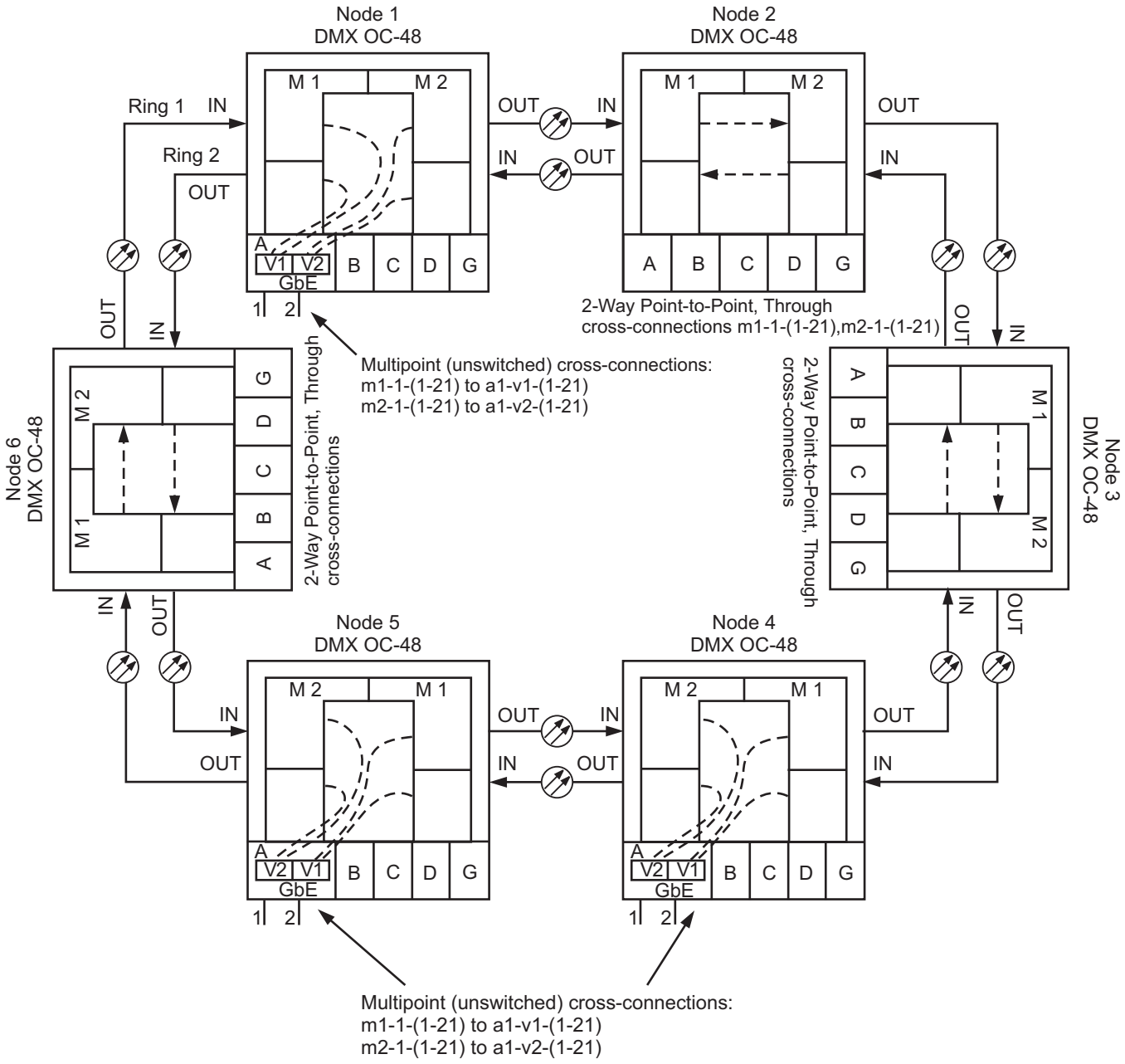
Figure 11-32 Multipoint mixed GbE and FE cross-connections on a UPSR



DMX = 1665 Data Multiplexer

NC-DMX-083-2

Figure 11-33 Multipoint GbE cross-connections on a UPSR



DMX = 1665 Data Multiplexer

NC-DMX-084-2

Figure 11-34 SONET protected 2F BLSR Add/Drop cross-connections on a BLSR without NUT

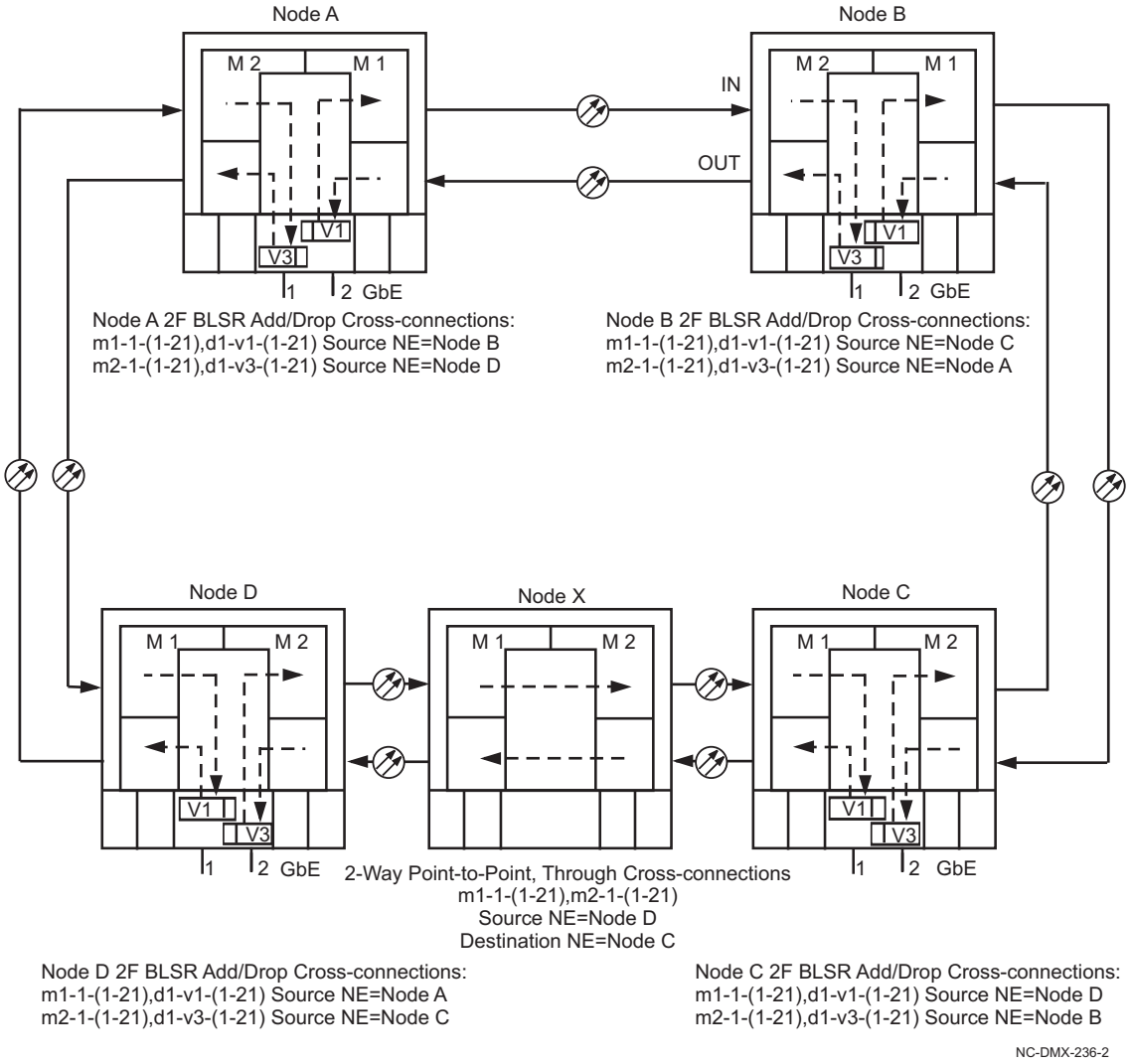


Figure 11-35 Multipoint (1way unswitched) cross-connections on a BLSR with NUT

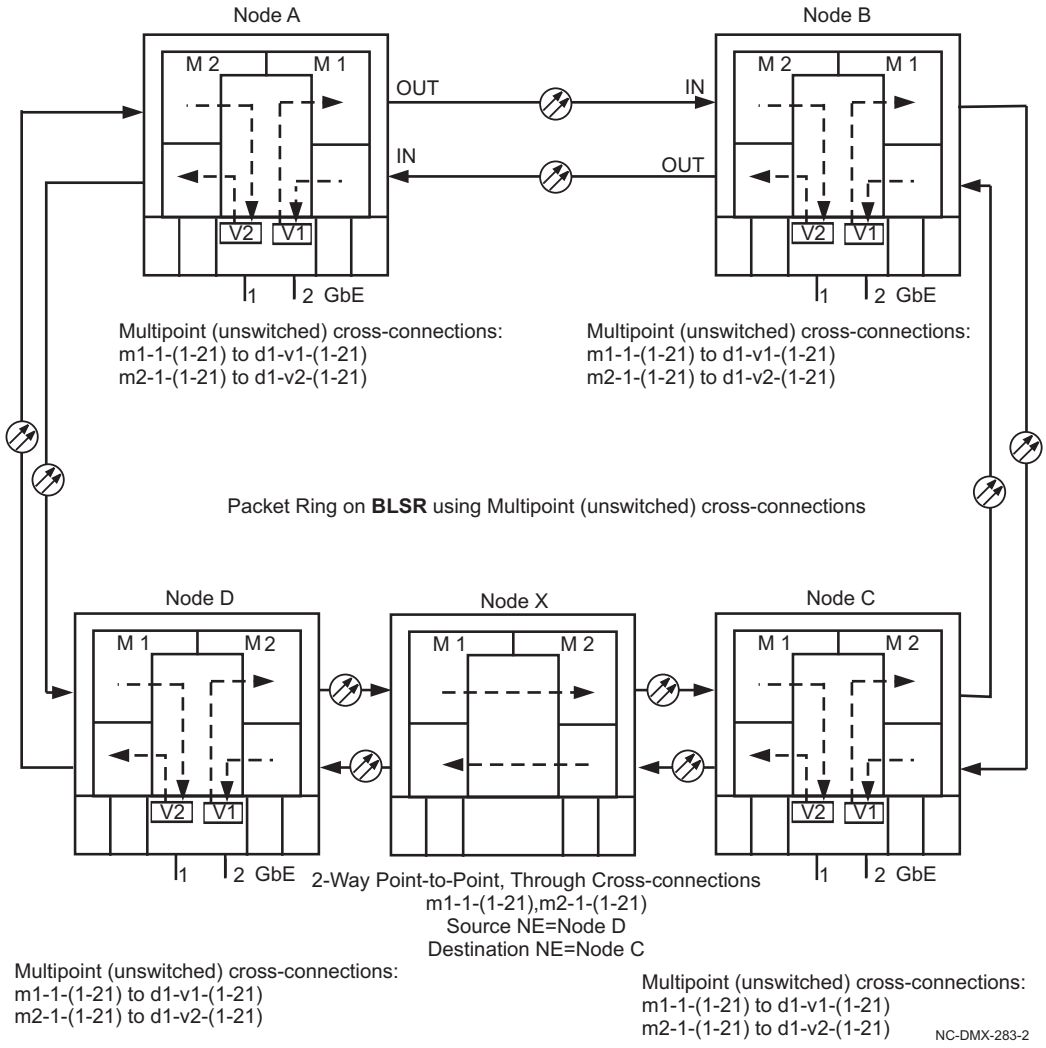


Figure 11-36 Point-to-Point 10/100-PL private line service, STS1 cross-connect mode, One STS1

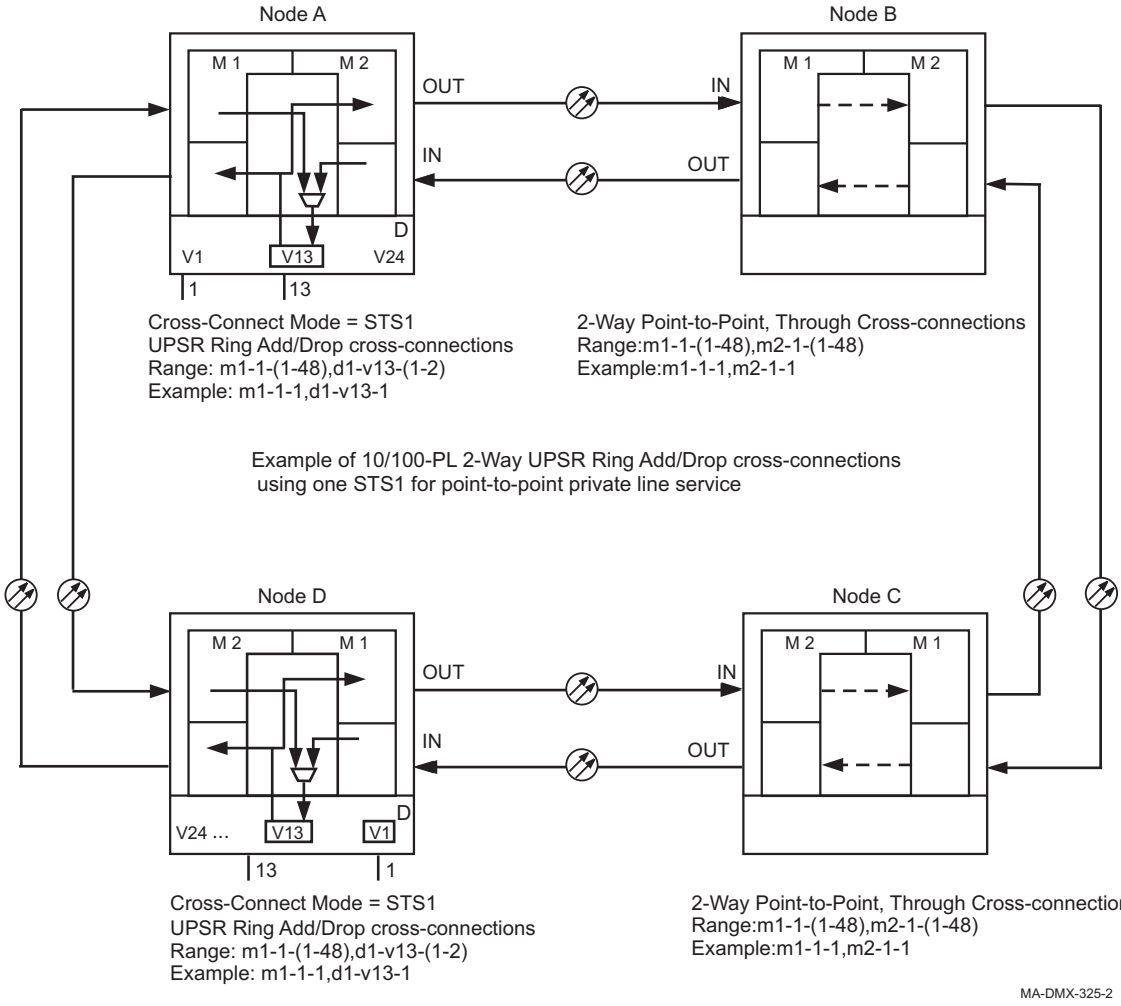


Figure 11-37 Multipoint 10/100-PL private line service, STS1 cross-connect mode, External Customer Protected

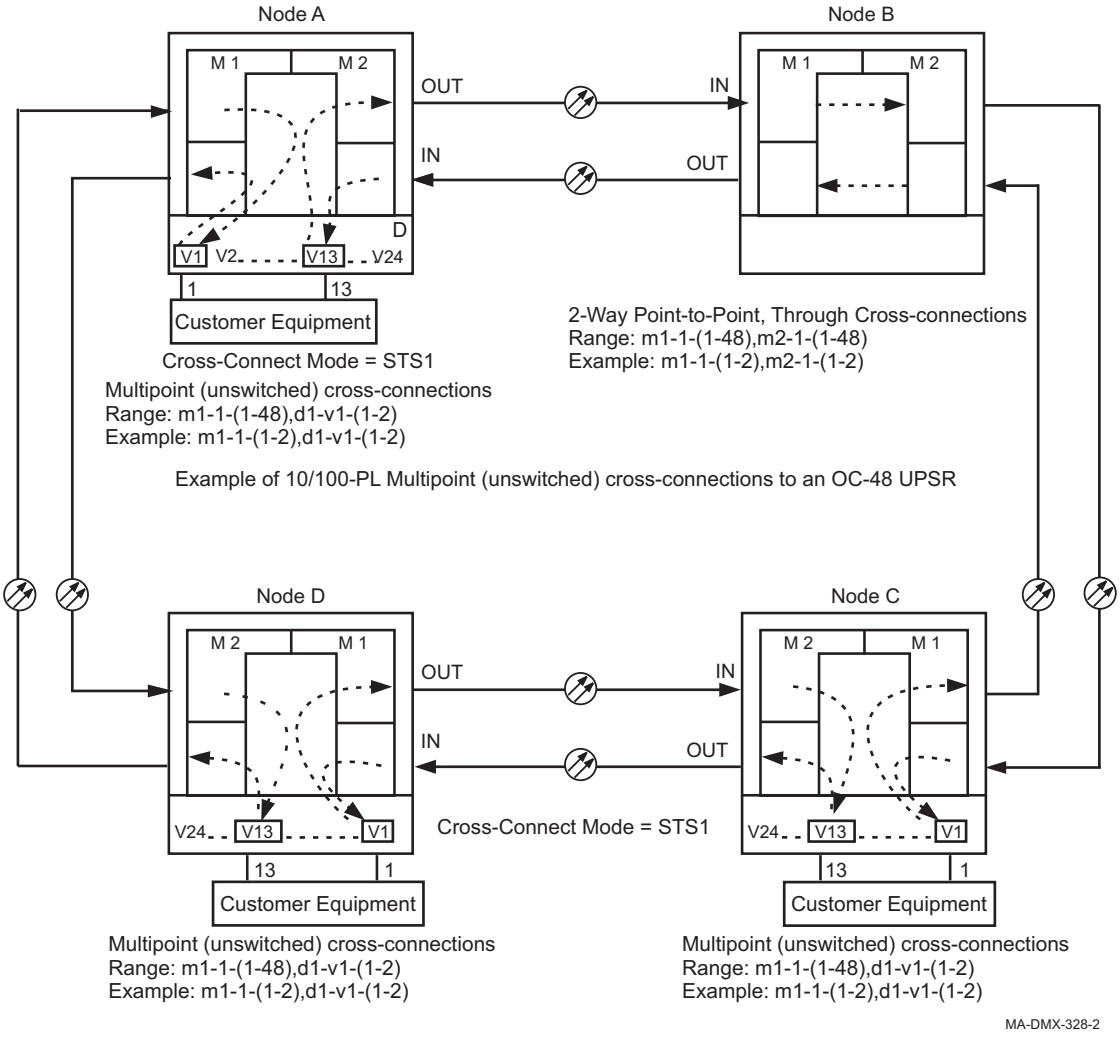
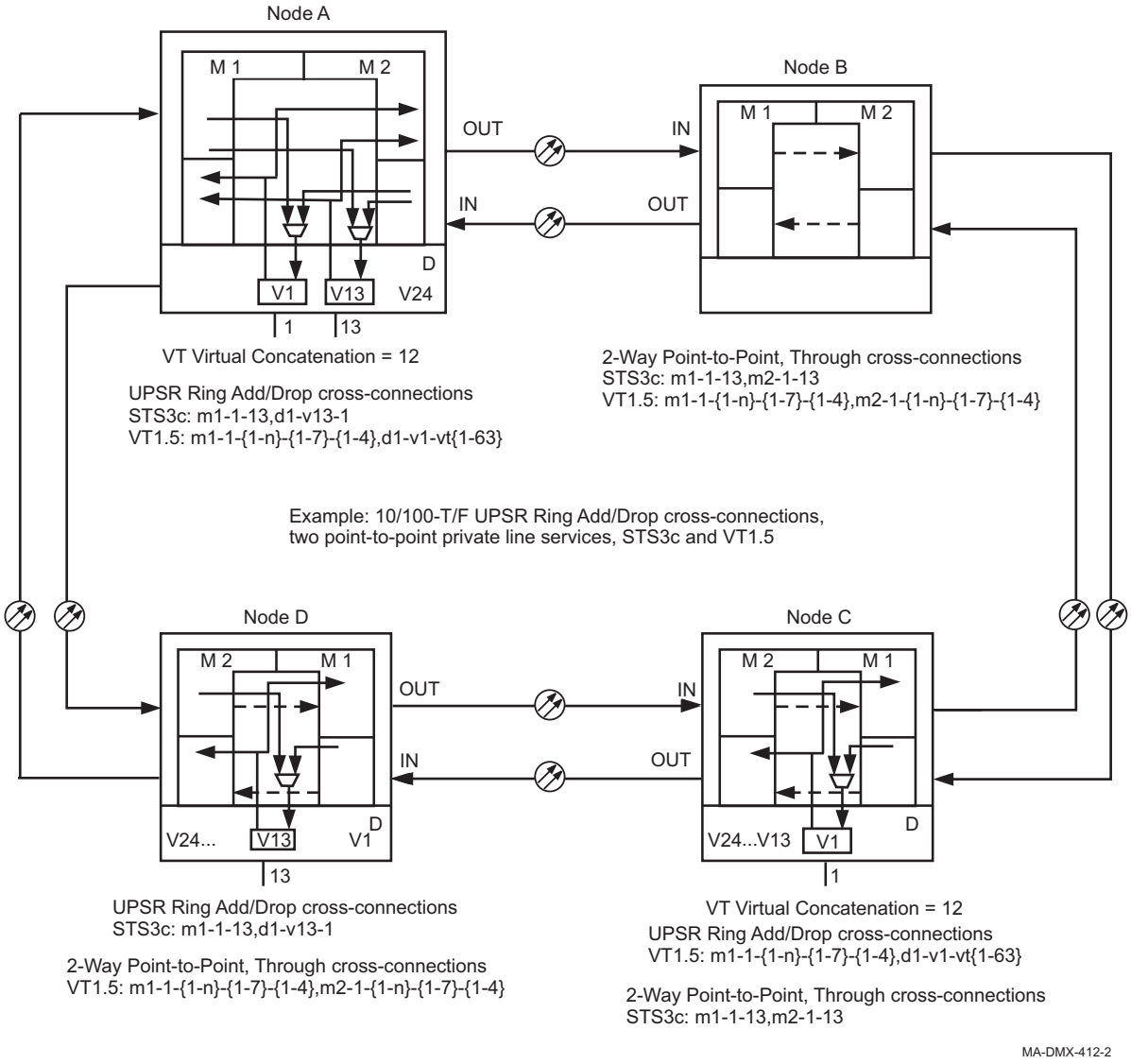


Figure 11-38 Two point-to-point 10/100-T/F private line services, STS3c and VT1.5



Cross-Connections for Ethernet

Cross-Connections for Ethernet

Cross-connections supporting Ethernet services vary according to the type of circuit pack being used:

- LNW63/64 GBE-PL Ethernet circuit packs support STS1, STS3c, or STS12c cross-connections.
- LNW87 FE/GBE-PL Ethernet circuit pack supports STS1, STS3c, or STS12c cross-connections.
- LNW66/67/68 Ethernet circuit packs support STS1 cross-connections.
- LNW70/LNW170 100/1G-FXS Ethernet circuit packs support STS1, STS3c, or STS12c cross-connections.
- LNW71 10/100-PL Ethernet circuit packs support STS1 and STS3c cross-connections.
- LNW74 10/100-T/F Ethernet circuit packs support STS1, STS3c, and VT1.5 cross-connections.
- LNW78 100/1G-FSR Ethernet circuit packs support STS1, STS3c, or STS12c cross-connections.

LNW63/64/87 Ethernet circuit packs:

For the LNW63/64/87 Ethernet circuit packs, each Ethernet virtual concatenation group (VCG) may have from 1 to 21 STS1s cross-connected to support the bandwidth assignment. For the LNW63 or LNW87, when used with non-VLF main circuit packs, the total circuit pack port capacity is 48 STS1s. For the LNW64/LNW87, the total circuit pack port capacity is 168/84 STS1s when used with VLF main circuit packs. The maximum capacity may be divided among the VCGs.

Cross-connect rates:

- STS1 or STS1 VCAT. Maximum of 21 STS-1s for each VCG.
- STS3c or STS3c VCAT. Maximum of 7 STS3c with 19 (1,4,7,10...) as the largest number STS1.
- STS12c. Supports 1 STS-12c.

LNW66/67/68 Ethernet circuit packs:

For the LNW66/67/68 Ethernet circuit packs, each Ethernet virtual concatenation group (VCG) may have from 1 to 21 STS1s cross-connected to support the bandwidth assignment.

LNW70/LNW170 Ethernet circuit packs:

- STS1 Ethernet Cross Connect Mode – LNW70/LNW170 Ethernet circuit packs in STS1 cross connect mode support up to 48 STS1s to individual VCGs with the following restrictions:
  - VCG 1-2 — Supports up to 48 STS-1s.
  - VCG 3-28 — Supports up to 32 STS-1s.
  - VCG 29-32— Supports up to 10 STS-1s.
- STS12c Ethernet Cross Connect Mode – LNW70/LNW170 Ethernet circuit packs in STS12c cross connect mode support one STS12c or virtual concatenation (VCAT) of up to 16 STS3c cross-connections with restrictions. The STS1 numbers used for STS3c cross-connects may be 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46.

  Individual VCGs have the following restrictions:
  - VCG 1-2 — Supports VCAT of up to 16 STS-3Cs or one STS-12c. The highest number of STS-3C that can be used in the order of 1, 4, 7, ... is 46.
  - VCG 3-28 — Supports VCAT of up to 10 STS-3Cs or one STS-12c. The highest number of STS-3C that can be used in the order of 1, 4, 7, ... is 28.
  - VCG 29-32 — Supports VCAT of up to 3 STS-3Cs. The highest number of STS-3C that can be used in the order of 1, 4, 7, ... is 7.

VCG Usage:

- NOTAG VLAN Tagging Mode – When the LNW70/LNW170 is used in Private Line (NOTAG) mode, there are 8 VCG's and there is a fixed mapping between 8 Ethernet ports and VCG ports: LAN-1 maps to VCG-1, etc.
- SWITCHED VLAN Tagging Mode – When the LNW70/LNW170 is used in SWITCHED mode, there are 32 VCG's. Cross-connections are established in the same way as in the NOTAG mode but there is no fixed mapping between LAN ports and VCGs.

LNW71 10/100-PL Ethernet circuit packs:

- STS1 Ethernet Cross Connect Mode – For the LNW71 10/100-PL circuit pack, one *or* two STS1 cross-connections may be made to each of the 24 VCGs in STS1 mode. In STS1 mode, the first STS1 cross-connection made to a VCG *should* be made to the first (1) STS1 tributary of the VCG.
- STS3c Ethernet Cross Connect Mode – In STS3c mode, at most one STS-3c *or* one STS-1 cross-connection may be made to each of the first 16 VCGs (1-16), (VCGs 17-24 are not used). In STS3c mode, if an STS1 cross-connection is made to a VCG, it *must* be made to the first (1) STS1 tributary of the VCG.

LNW74 10/100-T/F Ethernet circuit packs:

- VT Virtual Concatenation = 0 – LNW74 10/100-T/F Ethernet circuit packs with VT Virtual Concatenation set to 0 does not allow VT mapping and all 48 STS-1s are available for STS-1 VCAT and STS-3c. One to three STS-1s or one STS-3c may be assigned to each of the 24 VCGs up to the total capacity of 48 STS1s for the circuit pack.
- VT Virtual Concatenation = 12 – LNW74 10/100-T/F Ethernet circuit packs with VT Virtual Concatenation set to 12 allows VT mapping with 12 STS-1s reserved for VT mapping. The remaining 36 STS-1s are then available for STS-1 VCAT or STS-3c. Up to 336 VT1.5s may be used with up to 63 assigned to any VCG.

Ports may be provisioned until all the available 48 STS-1 equivalent bandwidth (including VT1.5s) is used.

LNW78 100/1G-FSR Ethernet circuit packs:

- STS1 Ethernet Cross Connect Mode – Supports virtual concatenation of STS1s up to a maximum of 24 STS1s cross-connected to each VCG.
- STS12c Ethernet Cross Connect Mode – Supports virtual concatenation of up to 8 STS3c or one STS12c to each VCG.

Important rules for cross-connections

Ethernet cross-connections tie together VCG tributaries in two or more Ethernet circuit packs through SONET STS-1 tributaries. For example, a cross-connection of m1-1-1 to d1-v1-1 at Node A, and a cross-connection of m1-1-1 to g1-v1-5 at Node B ties d1-v1-1 (VCG1, tributary 1) at Node A to g1-v1-5 (VCG1, tributary 5) at Node B.

When more than one VCG STS1 tributary is being cross-connected to provide an Ethernet service, the order in which the VCG tributaries are connected must be the same at both ends of a span. If the order is not correct, transmission will not be established. See examples below.

For multiple VCG STS1 tributary cross-connections, it is strongly suggested that VCG tributary cross-connections begin at VCG STS1 tributary #1, then VCG tributary #2, and so forth to the last cross-connection. It is also suggested that the VCG tributary cross-connections be made in an increasing (ascending) order at *each* end of the span as shown in the example that works.

This example works:

NODE A	NODE B
d1-v1-5 <-> m1-1-1	m1-1-1 <-> g1-v1-1
d1-v1-6 <-> m1-1-2	m1-1-2 <-> g1-v1-2
d1-v1-7 <-> m1-1-3	m1-1-3 <-> g1-v1-3

This example does not work:

NODE A	NODE B
d1-v1-5 <-> m1-1-1	m1-1-1 <-> g1-v1-3
d1-v1-6 <-> m1-1-2	m1-1-2 <-> g1-v1-2
d1-v1-7 <-> m1-1-3	m1-1-3 <-> g1-v1-1

For the LNW66/67/68 Ethernet circuit packs, a VCG alarm (indicating a tributary mismatch) would be raised in the case of the above example that does not work and transmission would not be established.

For the LNW71 10/100-PL circuit pack, transmission would not be established, but no alarm is raised to indicate a tributary mismatch.

Cross connect types

This section uses *WaveStar*® CIT Cross-Connection Wizard commands to describe some considerations when using path protected and unswitched cross-connections. Path protected cross-connections in this section include **UPSR Ring Add/Drop**, **2F BLSR Add/Drop**, and **2-Way Point-to-Point, Through**. Unswitched cross-connections are **Multipoint**.

Cross-connection provisioning using TL1 commands requires the use of multiple 1way, 1 waypr, and 1way unswitched cross-connections to make the appropriate cross-connections. **Multipoint** equivalent TL1 cross-connections are provisioned using four 1way unswitched cross-connections. **UPSR Ring Add/Drop** equivalent TL1 cross-connections are provisioned using two 1way and one 1waypr cross-connections. **2F BLSR Add/Drop** and **2-Way Point-to-Point, Through** equivalent TL1 cross-connections are provisioned using two 1way cross-connections.

Multipoint (unswitched) Cross-connections for LNW63/64/70/87 circuit packs

For the LNW63/64/87 and LNW70/LNW170 in NOTAG mode there is a fixed mapping between the Ethernet ports and VCG ports. Any VCG can be connected to either main slot. For the LNW63/64/70/87, there is no pairing of the VCGs when using multipoint cross-connections. For the LNW70/LNW170 in Switched mode, there is no fixed mapping between VCGs and LAN ports.

Multipoint (unswitched) Cross-connections for LNW66/67/68 circuit packs

Multipoint cross-connections are made by specifying an odd VCG number. The paired (next higher number) VCG is then automatically cross-connected. For example, when a Multipoint connection is made to an STS trib in VCG1 (e.g. a1-v1-1), a connection is automatically made internally to the corresponding STS trib in VCG2 (e.g. a1-v2-1). VCG v2 and associated trib then become unavailable for other connections. For the

LNW67/68 circuit packs, when a connection is made to an STS trib in VCG3, a connection is automatically made internally to the corresponding STS trib in VCG4. VCG v4 and associated trib then become unavailable for other connections.

The timeslot on the odd VCG is connected to Main-1 (West in case of a ring) and the same timeslot on the next higher (even) VCG is connected to Main-2 (East in case of a ring).

Multipoint (unswitched) Cross-connections for LNW71 circuit packs

In STS1 cross-connect mode, multipoint cross-connections may be made to all 24 VCGs. When a multipoint cross-connection is made to an STS trib in VCG "n", where n=1-12, (for example, v3), a connection is automatically made internally to the corresponding STS trib in VCG "n+12" (for example, v15).

In STS3c cross-connect mode, multipoint cross-connections may be made to the first 16 VCGs (1-16). When a multipoint cross-connection is made to an STS trib in VCG "n", where n=1-8, (for example, v2), a connection is automatically made internally to the corresponding STS trib in VCG "n+8" (for example, v10).

Multipoint (unswitched) Cross-connections for LNW74 circuit packs

The LNW74 circuit pack does not support multipoint cross-connections.

Multipoint (unswitched) Cross-connections for LNW78 circuit packs

Any VCG can be connected to either main slot. There is a fixed mapping between the RPR IF and the VCG pairs. The RPR IF is addressed using the odd-numbered VCG of the pair. In this release, there is only one RPR IF, VCG v1.

Path protected (add/drop) cross-connections for LNW66/67/68 circuit packs

When a path protected connection is made to an STS trib in VCG1, then VCG2 is unused and unavailable for any connection. For LNW67/68 circuit packs, when a path protected connection is made to an STS trib in VCG3, then VCG4 is unused and unavailable for any connection.

Path protected (add/drop) Cross-connections for LNW63/64/70/87 circuit packs

There is no pairing of SONET-protected cross-connections, any available VCG can be used.

Path protected (add/drop) Cross-connections for LNW71 circuit packs

Path protected cross-connections may be made to *all* 24 VCGs in STS1 mode. In STS3c mode, cross-connections may be made to *all* of the first 16 (1-16) VCGs.

Path protected (add/drop) cross-connections for LNW74 circuit packs

Cross-connections may be made to *all* 24 VCGs. One to three STS-1s or one STS-3c may be assigned to each of the 24 VCGs up to the total capacity of 48 STS1s for the circuit pack. When VT Virtual Concatenation is set to 12, up to 336 VT1.5s may be used with up to 63 assigned to any VCG.

Path protected (add/drop) Cross-connections for LNW78 circuit packs

The LNW78 circuit pack does not support path protected cross-connections.

Path protected (add/drop, pass-through) cross-connections

Path protected cross-connections using the *WaveStar*® CIT Cross-Connection Wizard request a two-way add/drop or pass-through cross-connection be established between the source and destination in a ring.

Figure 11-39, "2-Way Point-to-Point, Through cross-connection" (p. 11-221) illustrates a pass-through cross-connection from one side of the ring to the other.

Figure 11-39 2-Way Point-to-Point, Through cross-connection

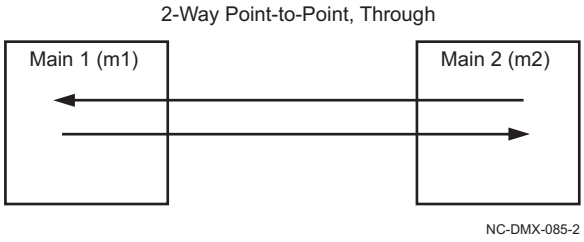


Figure 11-40, "UPSR Ring Add/Drop cross-connection" (p. 11-221) illustrates an Ethernet 2waypr add/drop cross-connection on a UPSR ring.

Figure 11-40 UPSR Ring Add/Drop cross-connection

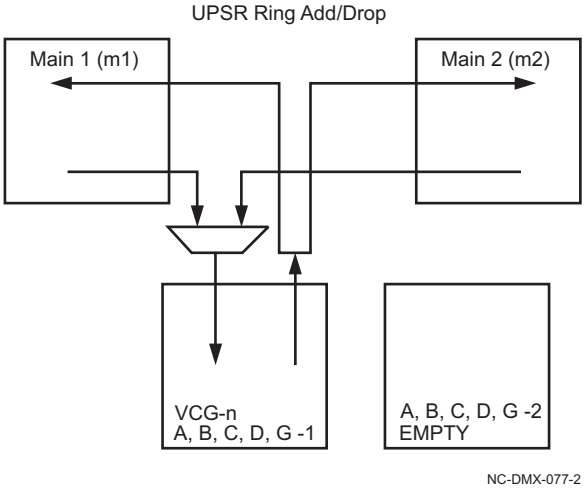


Figure 11-41, "FE to GbE 2-Way Hairpin cross-connection" (p. 11-222) illustrates a 2waypr hairpin cross-connection between a Fast Ethernet circuit pack and a Gigabit Ethernet circuit pack.

Figure 11-41 FE to GbE 2-Way Hairpin cross-connection

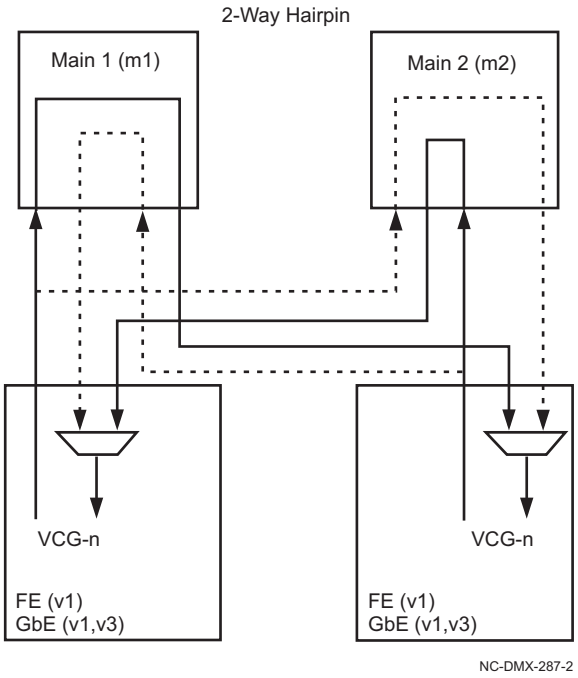
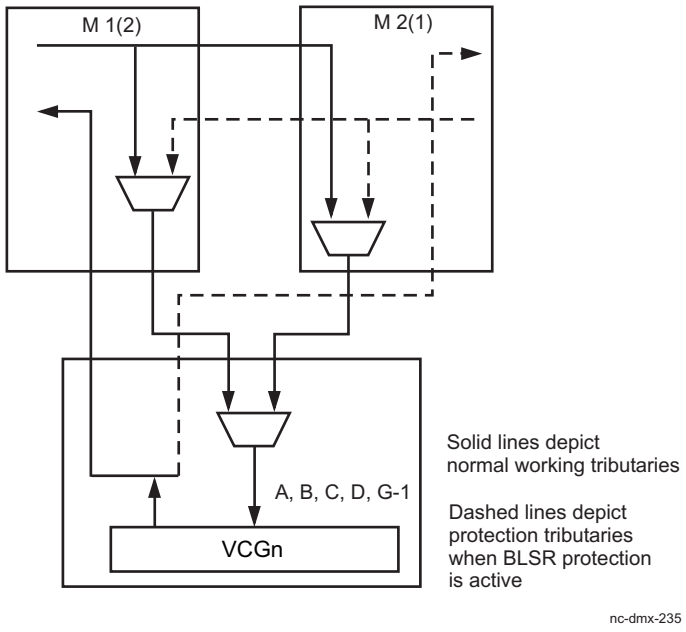


Figure 11-42, "2F BLSR Add/Drop cross-connection" (p. 11-222) illustrates an Ethernet 2-way add/drop cross-connection on a BLSR ring.

Figure 11-42 2F BLSR Add/Drop cross-connection

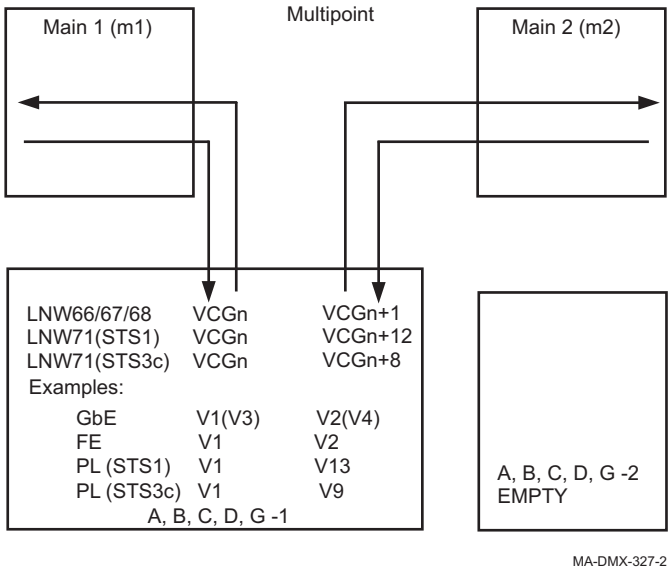


Multipoint (unswitched)

A multipoint (unswitched) cross-connection is established between the source and destination in a non-path switched ring configuration. The **Multipoint** cross-connect type can only be selected if an Ethernet interface is being addressed. When an Ethernet interface is multipoint cross-connected, the signal locking mechanism is provided.

Figure 11-43, “Multipoint (unswitched) cross-connection” (p. 11-223) illustrates a multipoint cross-connection.

Figure 11-43 Multipoint (unswitched) cross-connection



Procedure 11-25: Create preferred spanning tree configuration

Overview

This procedure provides an example to determine (and create) your preferred spanning tree configuration.

Important! Networks running 802.1d STP (Release 1.1) support a maximum of up to nine nodes participating in a spanning tree. Networks with more than nine nodes will not reconfigure properly. Spanning tree default parameters support a network of up to nine nodes.

Networks running 802.1w rapid spanning tree protocol (Release 2 or later) support more than nine nodes participating in a spanning tree. To support more than nine nodes in the spanning tree, the maximum age timer must be increased. Note that spanning tree restoration time increases as the number of nodes increase.

If the network consists of more than nine (9) nodes which are participating in the spanning tree configuration, use the following formula to determine the proper setting for the spanning tree maximum age timer (**`stmaxage`**): 2N + 6, where N equals the number of nodes.

For example, if the network consists of 16 nodes, then the **`stmaxage`** timer should be set to 38 seconds: 2 x (16) + 6 = 38.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Before you begin this procedure, you should:

- Refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter.
- Know your network configuration
- Know which nodes in the network are participating in the spanning tree configuration for the service being configured
- Have a knowledge of Ethernet services and spanning tree configurations

Steps

Use the following procedure as an example for determining the preferred spanning tree configuration.

1 Use the *WaveStar*® CIT to log in to a terminating Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu at each node, select **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions and the network map, determine the nodes in the ring at which Ethernet services are provided and are part of the same spanning tree group.

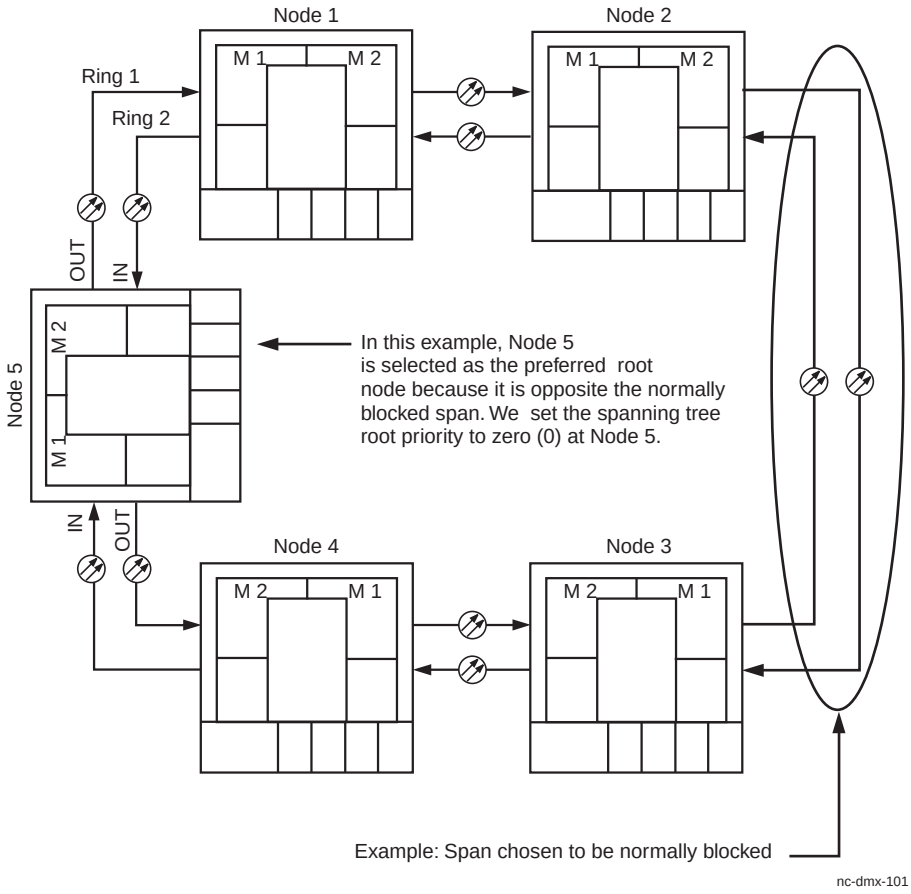
Important! When determining if the ring consists of an odd or even number of nodes, count only the nodes at which Ethernet service is being provided in the same spanning tree configuration. If a node in the ring has only SONET pass through cross-connections for Ethernet services, that node is not counted in determining an odd or even configuration. The figures in this procedure assume all nodes are providing Ethernet service.

5 Determine if the ring consists of an odd or even number of nodes.

If...	Then...
there are an ODD number of nodes in the ring,	Continue with Step 6.
there are an EVEN number of nodes in the ring,	Proceed to Step 12.

6 Refer to Figure 11-44, "Spanning tree odd node example" (p. 11-226) for rings with an odd number of nodes.

Figure 11-44 Spanning tree odd node example



7 Select the span that should be blocked under nominal conditions. The span should be selected based on traffic patterns to get the most efficient use of capacity on both sides of the ring during nominal conditions.

The span between Nodes 2 and 3 was selected in this example.

8 Determine the preferred root node. The preferred root node in an odd-number node ring is the node on the ring opposite the span which should be normally blocked.

In the odd node configuration figure above, Node 5 is the preferred root node.

9 Use the *WaveStar*® CIT to log in to the preferred root node.

10 From the System View menu, select **Configuration** → **Data** → **Create Spanning Tree Group** or use the **`ent-stgrp`** TL1 command.

Result: The *Create Spanning Tree Group* window opens displaying the parameters for the spanning tree group.

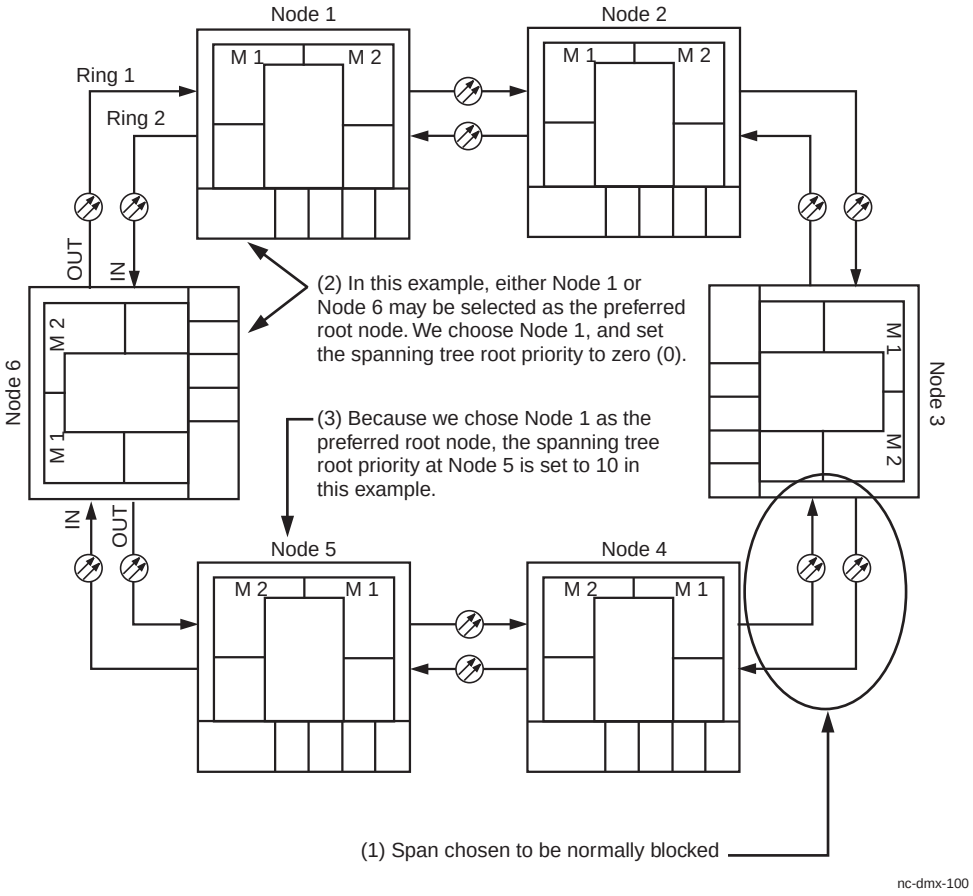
11 Set the spanning tree Root Priority parameter (*strp*) to zero (0) at the preferred root node (Node 5 in this example).

At ALL other Ethernet nodes in the ring, set the spanning tree root priority to the default value of 32768.

END OF STEPS FOR ODD NODE EXAMPLE

12 Refer to Figure 11-45, "Spanning tree even node example" (p. 11-227) for rings with an EVEN number of nodes:

Figure 11-45 Spanning tree even node example



13 Select the span that should be blocked under nominal conditions. The span should be selected based on traffic patterns to get the most efficient use of capacity on both sides of the ring during nominal conditions.

The span between Nodes 3 and 4 was selected in this example.

14 Determine the preferred root node. The preferred root node in an even-number node ring may be either of the two nodes at the opposite ends of the span that is opposite to the span which is normally blocked.

In the even node configuration figure above, either Node 1 or Node 6 may be selected as the preferred root node. Note that there are 2 spans between Node 3 and Node 1, and two spans between Node 4 and Node 6. In this example, we choose Node 1 to be the preferred root node.

15 Use the *WaveStar*® CIT to log in to the preferred root node.

16 From the **System View** menu, select **Configuration** → **Data** → **Create Spanning Tree Group** or use the **`ent-stgrp`** TL1 command.

Result: The *Create Spanning Tree Group* window opens displaying the parameters for the spanning tree group.

17 Set the spanning tree Root Priority parameter (*strp*) to zero (0) at the preferred root node (Node 1 in this example).

18 Determine the node opposite the selected preferred root node.

In this example, Node 4 is the node opposite Node 1, the preferred root node. Note that there are two nodes on either side of the ring between Node 1 and Node 4.

19 At the node (in this example, Node 4) opposite the selected preferred root node, follow the span that is NOT normally blocked to the next node in that direction around the ring.

In this example, the span to the right of Node 4 is normally blocked; therefore, you would follow the span to the left of Node 4 to Node 5.

20 At the node determined in the previous step (in this example, Node 5), use the *WaveStar*® CIT to log in to the node.

21 From the System View menu, select **Configuration** → **Data** → **Create Spanning Tree Group** or use the **`ent-stgrp`** TL1 command.

Result: The *Create Spanning Tree Group* window opens displaying the parameters for the spanning tree group.

22 Set the spanning tree Root Priority parameter (*strp*) to 10 (or any value from 1 to 32767).

Important! The spanning tree root priority for ALL other Ethernet nodes in the ring should be set to the default value of 32768.

END OF STEPS

Procedure 11-26: Change an existing spanning tree configuration

Overview

This procedure provides an example of how to change an existing spanning tree configuration by changing the spanning tree path cost at one of the nodes.

This procedure might be used if traffic patterns change and dictate that a reconfiguration would provide more efficient service.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Safety precautions

To assure both personal safety and the proper functioning of the Alcatel-Lucent 1665 Data Multiplexer, it is imperative to review and understand these warnings and precautions prior to performing this procedure.



NOTICE

Service-disruption hazard

A minimal amount of service interruption may be encountered when performing this procedure.

Be sure to follow your work instructions in performing this procedure.

Before you begin

Before you begin this procedure, you should:

- Refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter.
- Know your network configuration.
- Know which nodes in the network are participating in the spanning tree configuration for the service being configured.
- Have a knowledge of Ethernet services and spanning tree configurations.
- Have detailed work instructions for performing this procedure.
- Know which span in the spanning tree configuration is normally blocked and which span you are going to reconfigure as blocked.

- Know which node is the root node (root bridge) in the configuration.
- Know the spanning tree group ID (*stgrpid*) of the spanning tree group being reconfigured.

Steps

Use this procedure as an example to reconfigure an existing spanning tree configuration.

1 Use the *WaveStar*® CIT to log in to a terminating Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions and the network map, determine the nodes in the ring at which Ethernet services are provided and are part of the same spanning tree group. Figure 11-46, "Existing spanning tree configuration" (p. 11-233) for an example.

5 Use the **`rtrv-stgrp`** command or the **View** → **Data** → **Spanning Tree Group** command from the System View menu at each node to determine which node is the root node (root bridge), the spanning tree root path cost (**`strtpcost`**), the VCG spanning tree port role (**`stprole`**), and the VCG spanning tree path cost (**`stpcost`**) for each VCG AID in the spanning tree group. Make a note of these parameter values at each node.

Reference: See Figure 11-46, "Existing spanning tree configuration" (p. 11-233). Assuming VCGs v1 and v2 are used at each node, if you logged into Node 5, the root bridge, you should see a root path cost of zero (0), and each VCG port would have a port role of *Designated*.

At Nodes 1 and 2, you should see Port Roles for VCG v1 at both nodes as being *root* port, indicating traffic toward the root bridge. At Nodes 3 and 4, you should see Port Roles for VCG v2 at both nodes as being *root* port, indicating traffic toward the root bridge.

6 PRINCIPLES OF SPANNING TREE AND PORT COST

Refer to Figure 11-46, "Existing spanning tree configuration" (p. 11-233) and read the following to understand how spanning tree blocks a span:

To have spanning tree block a span, the spanning tree root path cost is set equally at the two bridges (nodes) at each end of the blocked span. The spanning tree root path cost (**strtpcost**) at a node (bridge) is the sum of the path costs of the root port VCGs that connect the node to the root node.

Assume that in the original configuration the spanning tree path cost (**stpcost**) for each VCG is set to the default of 10 at each node. Node 2 is connected to root Node 5 through VCG v1 at Node 2 and VCG v1 at Node 1. Therefore, the root path cost of Node 2 is 20, which is the sum of the path costs of Node 2 VCG v1 and Node 1 VCG v1 (10 + 10 = 20).

Node 3 is connected to root Node 5 through VCG v2 at Node 3 and VCG v2 at Node 4. Therefore, the root path cost of Node 3 is also 20, which is the sum of the path costs of Node 3 VCG v2 and Node 4 VCG v2 (10 + 10 = 20).

7 Assume that your traffic studies indicate a more efficient service would be obtained by blocking the span between Node 3 and Node 4 instead of the presently blocked span between Node 2 and Node 3.

8 HOW TO CHANGE PATH COST TO RECONFIGURE SPANNING TREE

To change the spanning tree configuration to block the span between Nodes 3 and 4, we need to have the root path cost of Node 3 and Node 4 set equally.

We can increase the spanning tree path cost (**stpcost**) at the root port (VCG v2) on Node 4. To change the path cost, use either the **ed-vcg** command or select**Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, select the VCG, then click on the Spanning Tree tab. Change the value in the **Spanning Tree Path Cost** box, then click **Apply**.

Reference: Refer to Figure 11-47, "New spanning tree configuration" (p. 11-234).

If the span between Nodes 3 and 4 is going to be blocked, then Node 3 will be connected to root Node 5 through Node 3 VCG v1, Node 2 VCG v1, and Node 1 VCG v1. The root path cost at Node 3 will then be 30, the sum of the path costs of root port VCG v1 at Nodes 3, 2, and 1 (10 + 10 +10 = 30).

We need to ensure the root path cost at Node 4 is also 30. Note that Node 4 is connected to root Node 5 only through Node 4's VCG v2. If we increase the path cost at Node 4 VCG v2 to 30, then the root path cost at Node 4 will also be 30.

Since the root path cost at Node 4 is now equal to the root path cost at Node 3, the span between Nodes 3 and 4 will be blocked.

END OF STEPS

Figure 11-46 Existing spanning tree configuration

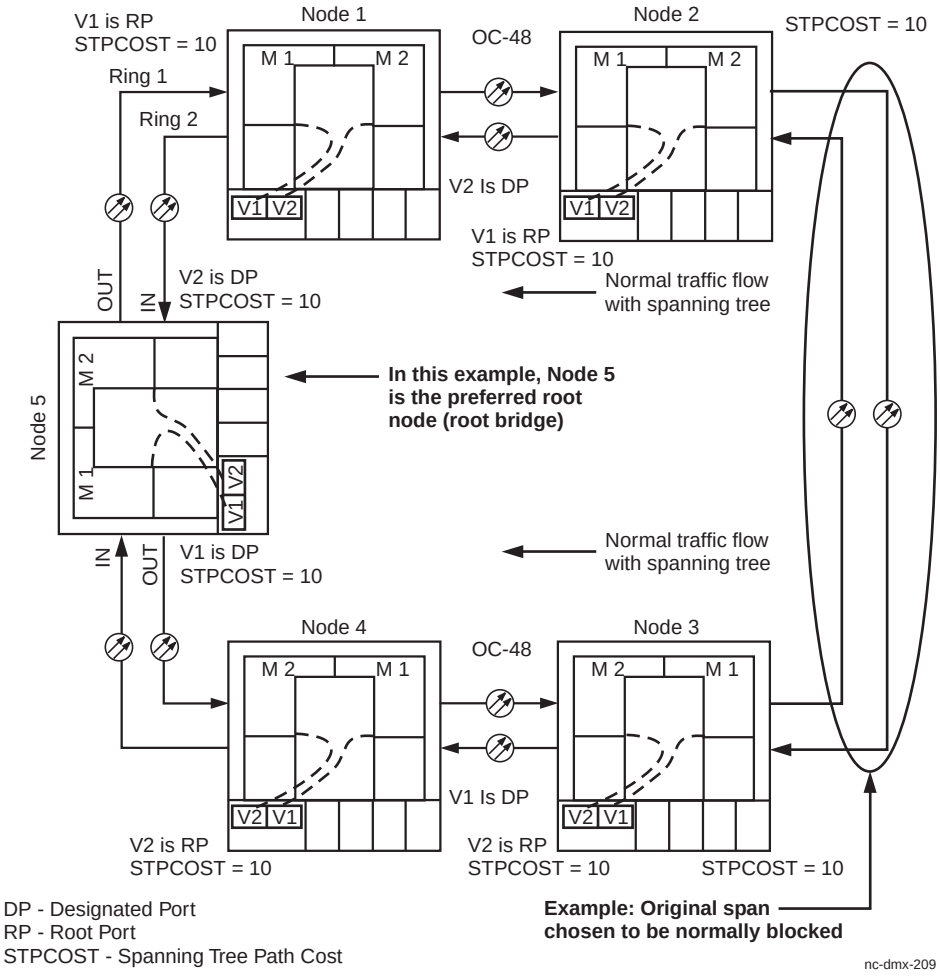
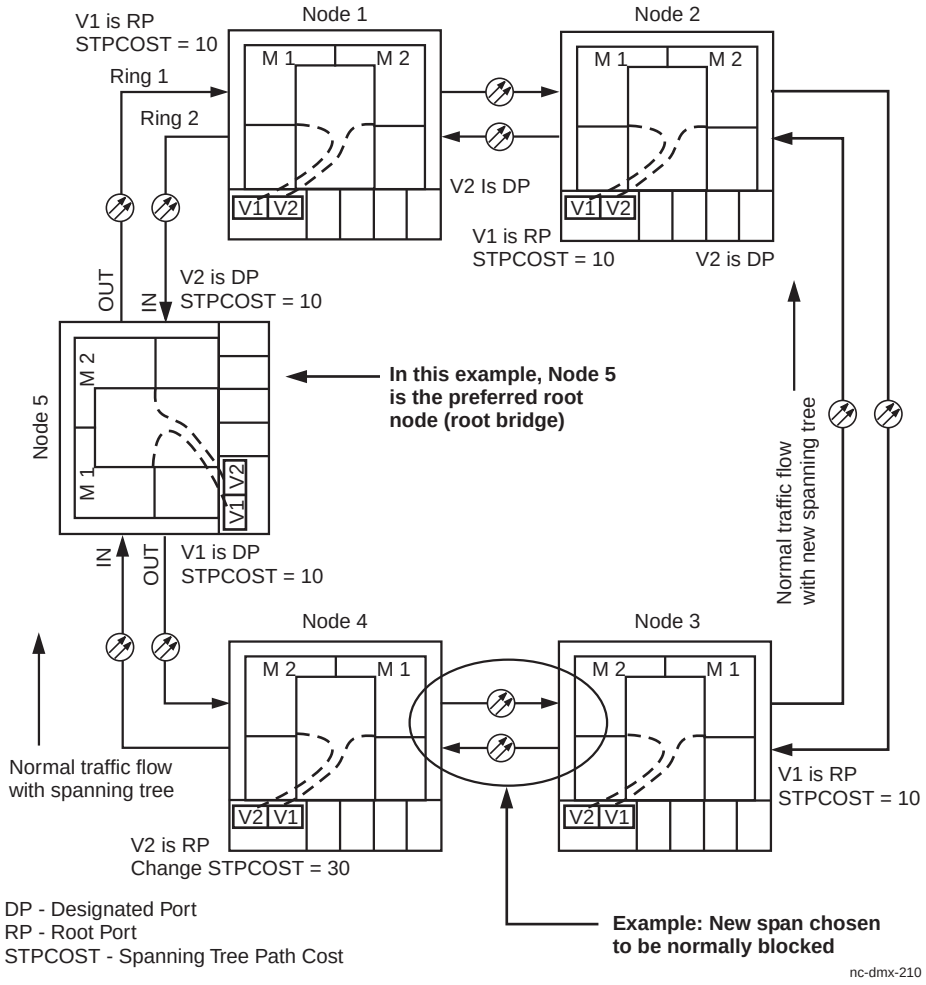


Figure 11-47 New spanning tree configuration



Procedure 11-27: Create/Delete/Lock MAC address on a port

Overview

Use this procedure to create, delete, or lock a MAC address on a port. Does not apply to circuit packs provisioned for NOTAG mode. See "MAC Addressing/Learning" (p. 11-237) and "MAC Address Locking" (p. 11-238) at the end of this procedure for additional information.

The **Configuration** → **Data** → **Create (or Delete) MAC Address** command (**`ent-mac/dlt-mac`** TL1 command) from the System View menu allows you to create/delete or modify a MAC address + VLAN ID (VID) on a port. Use the command to provision persistent and filtered MAC addresses. A persistent MAC will bypass the normal aging process. Filtering on a MAC source address allows an operator to drop frames from a disruptive user based on the MAC address. Ethernet frames received by any port in that VLAN on the pack (Virtual Switch on the LNW70/LNW170/LNW78) with the MAC as filtered will be dropped.

When provisioning a MAC address, the MAC address must be valid, a VLAN/Port Tag must be specified, and the type must be specified. The VLAN or Port Tag must already exist in the Virtual Switch (VS) and be assigned to the selected LAN/WAN port. Unicast only MAC addresses are supported.

MAC Address Locking restricts access to an Ethernet bridged network. The MAC source address (SA) of traffic entering a locked port must match a persistent MAC address provisioned for that port. Any LAN, VCG, or Link Aggregation Group (LAG) may be put in the MAC address locking mode using the **`ed-eport/ed-vcg`** TL1 commands or the *WaveStar*® CIT **Configuration** → **Equipment** command. MAC address locking applies to LNW70/LNW170 circuit packs only.

Privilege level

You must login at least as a General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports, MAC addresses + VLAN IDs being provisioned.
- The MAC Address type (Persistent or Filtered) being assigned.

Steps

Use the following procedure to provision MAC Addresses/MAC Address Locking:

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2

If...	Then...
you are creating or deleting MAC addresses,	continue with Step 3.
you are enabling/disabling MAC Address Locking,	proceed to Step 8.

3 Select **Configuration** → **Data** → **Create (or Delete) MAC Address** from the System View menu.

Result: The *Create MAC Address* or *Delete MAC Address* window opens.

4 Select the circuit pack being provisioned, then click **Select**.

Result: The *Create MAC Address* or *Delete MAC Address* for "circuit pack AID" window opens.

5 Click on an entry in the table presented to Create/Modify an entry (if Create was chosen), or to Delete an entry (if Delete was chosen).

Result: A window opens displaying the parameters you have chosen and the options you may perform.

6 Select the required options (parameters) in the display window to add/modify/delete the necessary parameters.

7 Click on one of the buttons at the bottom of the window to **Create**/**Modify** or **Delete** the selections, as required.

End of MAC Address provisioning. If required, continue with the next step to Enable/Disable MAC Address Locking.

8 Select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack being provisioned, select the port, then click **Select** at the bottom of the window.

9 Click on the **Traffic Provisioning** tab at the top of the window.

10 For **Locked Source Address**, select **`ENABLE`** or **`DISABLE`**, as required. Click **Apply**, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

END OF STEPS

MAC Addressing/Learning

When an Ethernet frame is received on a port, the source MAC address + VLAN ID (MAC + VID) can be learned by the port if the port is a member of that VLAN, and the MAC + VID has not been provisioned as persistent on another port in the VS. If a frame is subsequently received with the same MAC + VID by a different port in the same VLAN and VS, the MAC+VID is forgotten on the old port and learned on the new. Source addresses are learned so that when a frame is received on a port in the VS with that MAC+VID as its destination address, it will be forwarded only to the port which has learned that address. In this regard, provisioned persistent addresses behave as permanently learned addresses.

When changing VLAN tagging mode, the MAC+VLAN addresses are cleared by the deletion of the virtual switch. When the VLAN tagging mode is set to private line (NO TAG), this feature is disabled and all TL1 MAC address commands are denied.

The **Configuration** → **Data** → **Create (or Delete) MAC Address** command (**`ent-mac/dlt-mac`** TL1 command) from the System View menu allows you to create/delete or modify a MAC address on a port. Use the command to provision persistent and filtered MAC addresses. See Table 11-4, “ENT-MAC command provisionable parameters” (p. 11-238) for a list of provisionable parameters.

ENT-MAC command parameters

Table 11-4, “ENT-MAC command provisionable parameters” (p. 11-238) lists the provisionable parameters for the **`ent-mac`** command.

Table 11-4 ENT-MAC command provisionable parameters

Parameter	Description
portaid	**Port AID.** This is the Ethernet LAN/VCG/LAG Port AID where the address is provisioned. For RPR circuit packs, addresses provisioned on an RPR span cause traffic destined to that address to preferentially take that span. A Link Aggregation Group (LAG) AID is valid if the member ports are consistent with the slot **aid**. The port AID of a port that is a member of a LAG is not valid.
tag	**TAG ID**. VLAN or port tag. Value: An integer in the range 1 - 4093. When vlantagmd is 802.1TAG, VLAN is used. When vlantagmd is TRANS, port tag is used. When vlantagmd is NOTAG, the command is not supported.
mac	**MAC Address.**. Value: A string of 12 hexadecimal characters. Unicast MAC addresses only are supported.
type	**MAC Address Type**. Valid values are: • PERSISTENT - address will not age out, the same address is allowed on only one port in a circuit pack. • FILTERED - frame with filtered source MAC is dropped. The same address is allowed on many ports.
rpr_mac	**RPR MAC Address**. This parameter applies only to RPR circuit packs. It is the address of the RPR station through which the "mac" is reached. It applies and is required if, and only if, portaid is a valid RPR Span and enh_brdgmd (see ED-RPR) is set to ENABLE.

MAC Address Locking

MAC Address Locking applies only to LNW70/LNW170 circuit pack ports.

Any LNW70/LNW170 Ethernet LAN or VCG port may be put in the MAC address locking mode using the "locked_sa" parameter in the **ed-eport/ed-vcg** commands or the *WaveStar*® CIT **Configuration** → **Equipment** command, selecting the port, clicking on the **Traffic Provisioning** tab, then selecting **ENABLE** for the **Locked Source Address**.

Only MAC addresses of type "persistent" are allowed for a locked port. Before entering locked mode, all static MAC entries of type "filtered" must have been removed.

Other features are as follows:

- Frames received with a source address plus VLAN ID (SA + VID) matching a static entry of type persistent for that port are admitted. All other frames ingressing the port are discarded.
- Multiple locked persistent entries can be applied to the port. Multiple ports may be locked. Frames received on one locked port having the locked SA+VID for another are dropped.
- No other port in the virtual switch can have the same persistent entry. A persistent address cannot be learned in its VLAN on any port in the virtual switch. If frames having a destination address plus VLAN ID (DA + VID) of a locked address are received on another port in the virtual switch, they are sent only to the locked_sa port
- When entering locked mode, all dynamic entries for the port are flushed. A port in locked mode does not learn addresses.
- Unlocked ports can still have persistent entries (including for a locked address, but only in a different VLAN or VS). So a client of a locked port can send traffic to a DA which may be routed by learning or by another port's persistent entry, the same as for an unlocked port.
- Frames dropped due to locked-address filtering are counted.
- A LAG may be locked. The persistent address belongs to the LAG, not the member ports. The locked source address parameter is set to its initial value if a port is removed from a virtual switch.

Procedure 11-28: Provision Q in Q stacked VLAN capability

Overview

Use this procedure as a reference to provision the LAN/WAN Ethertype parameters (Tag Protocol Identifier [TPID]) and port tags for stacked VLANs.

The examples in this procedure use a 3-node UPSR ring to illustrate the provisioning. It is assumed that the ring is properly provisioned for a multipoint (unswitched) Ethernet service using transparent (TRANS) mode at each of the Ethernet circuit packs. Prior provisioning includes provisioning the necessary multipoint (unswitched) cross-connections and setting up a virtual switch containing the LAN ports and VCG (WAN) ports being used.

In these examples, Node 1 is considered to be the customer interface node (ingress) and Node 3 is considered to be the network interface node that connects to a QinQ switch/router. Node 2 is configured to be a packet layer pass-through where the pass-through is performed by the switch, not at the SONET layer, in anticipation of service being added.

Privilege level

You must login at least as a General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports, being provisioned.
- The Ethernet Type values (TPID), port tag VLANs being assigned.

Steps

Use the following examples for provisioning Ethertype and port tag parameters:

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Use the **Configuration** → **Data** → **Create Port Tag** from the System View menu to provision the port tags, if not already performed. Use the **Configuration** → **Equipment** command, select the port, to provision the port parameters, including the **Ethernet Type (TPID)** value located under the **Traffic Provisioning** tab of the port parameters. Or, use the **`ed-eport/ed-vcg`** TL1 commands to provision the parameters in these examples.

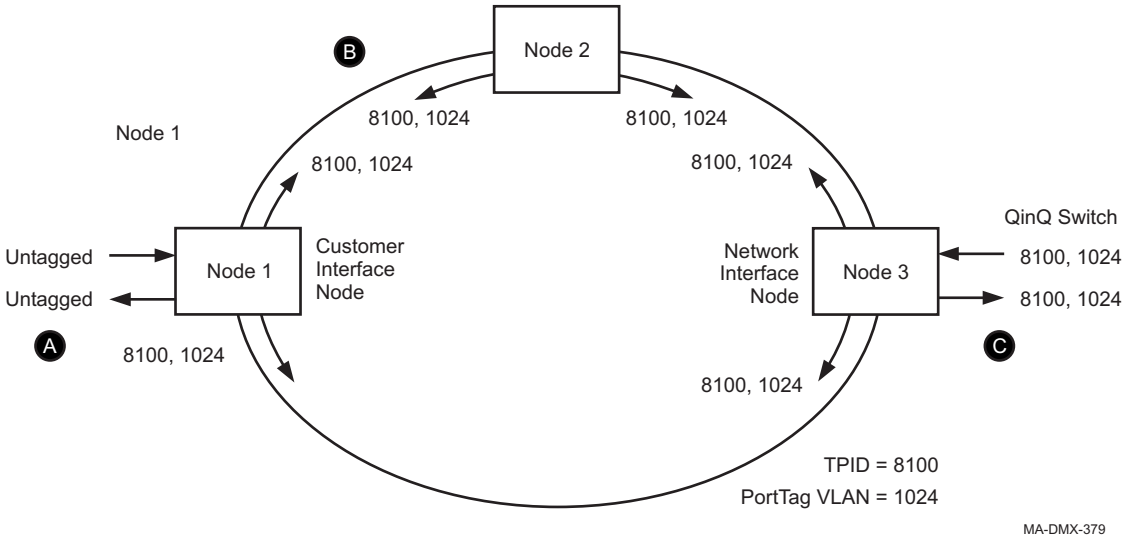
Important! The Peak Information Rate (PIR) rate limiting feature on the LNW66/LNW67/LNW68 circuit packs will not be effective in transparent mode if the Ethernet Type (ethertype) parameter for the LAN or WAN VCG ports is provisioned to any value other than FFFF or 8100.

END OF STEPS

Example 1: Standard untagged frame

See Figure 11-48, "Example 1 configuration" (p. 11-241) for this example.

Figure 11-48 Example 1 configuration



This example assumes that:

- The incoming traffic at Node 1 consists of "standard untagged frames" (no TPID value or TPID value other than FFFF or 8100).
- Provisioning is performed as illustrated in the following table

Table 11-5 Provisioning for example 1

Node	LAN (eport)			WAN (vcg)		
	TPID	dftporttag	addporttag	TPID	dftporttag	addporttag
Node 1	FFFF (8100 for LNW70/LNW170)	1024		8100		1024
Node 2				8100		1024
Node 3	8100		1024	8100		1024

As a result of the provisioning illustrated in Figure 11-48, “Example 1 configuration” (p. 11-241), and the prior assumptions, the following results are obtained:

- A data stream of "standard tagged frames" with a TPID value of 8100, port tag VLAN value of 1024, and default priority value is assigned at Node 1 and transmitted out the LAN (eport) at Node 3.
- The frame headers at the points labeled A, B, and C contain the following data:

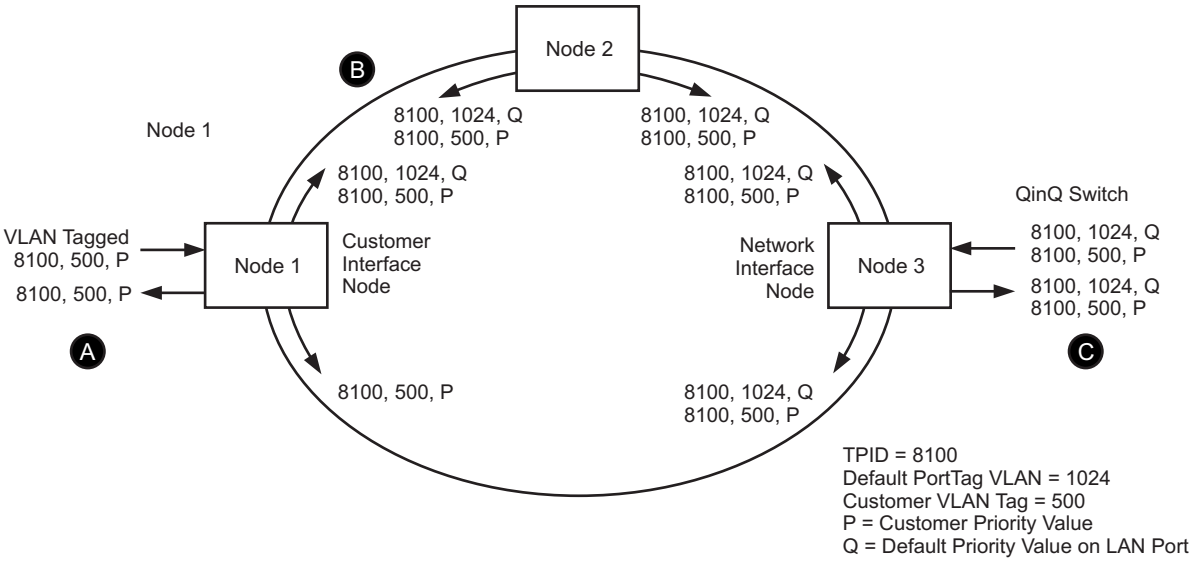
Table 11-6 Expected results for frame headers in example 1

Points	Destination Address	Source Address	VLAN TPID & Tag (Outer)	VLAN TPID & Tag (Inner)	...
A	C	A	NA (not applicable)	NA	
B	C	A	81 00 04 00	NA	
C	C	A	81 00 04 00	NA	

Example 2: Standard VLAN tagged frames

See Figure 11-49, “ Example 2 configuration” (p. 11-243) for this example.

Figure 11-49 Example 2 configuration



This example assumes that:

- The incoming traffic at Node 1 consists of "standard *VLAN* tagged frames" (TPID value 8100), VLAN port tag set to 500, and the priority set to a non-default value (P).
- Provisioning is performed as illustrated in the following table.

Table 11-7 Provisioning for example 2

Node	LAN (eport)			WAN (vcg)		
	TPID	dftporttag	addporttag	TPID	dftporttag	addporttag
Node 1	FFFF (8100 for LNW70/LNW170)	1024		8100		1024
Node 2				8100		1024
Node 3	8100		1024	8100		1024

As a result of the provisioning illustrated in Figure 11-49, “ Example 2 configuration” (p. 11-243), and the prior assumptions, the following results are obtained:

- A data stream of "double tagged frames" is transmitted out the eport on Node 3. The inner tag (8100, 500, and priority value [P]) are the ones provided by the end customer at Node 1. The outer tag (8100, 1024, and default priority value [Q] for LAN port) are assigned by Node 1.
- The frame headers at the points labeled A, B, and C contain the following data:

Table 11-8 Expected results for frame headers in example 2

Points	Destination Address	Source Address	VLAN TPID & Tag (Outer)	VLAN TPID & Tag (Inner)	...
A	C	A	NA	81 00 01 F4	
B	C	A	81 00 04 00	81 00 01 F4	
C	C	A	81 00 04 00	81 00 01 F4	

Procedure 11-29: Perform Ethernet loopback transmission test

Overview

Use this procedure to perform an Ethernet loopback transmission test. It is assumed that the Ethernet packet ring or point-to-point service has been configured using the procedures in this chapter.

Important! The Port Maintenance parameter for the affected ports must be provisioned *Allow* to perform this procedure. If the Port Maintenance parameter for the affected ports is provisioned *Inhibit*, loopback commands for the affected ports are denied.

To view and provision the Port Maintenance parameter, a Privileged user must perform Procedure 7-23: “Allow/inhibit port/tributary maintenance” (p. 7-61).

Privilege level

You must login as a General or Privileged user to complete this procedure.

Important! The following rules apply for this test:

- Only out-of-service testing may be performed.
- Only one loopback is allowed on a circuit pack.
- Only one loopback is allowed on any one port in a multipoint packet ring, even if they are on different nodes

Before you begin

Prior to performing this procedure, refer to “Before you begin” (p. 11-4) and “Required equipment” (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports that are being tested.

You must have an Ethernet test set capable of applying the external test signal required for this procedure.

Steps

Use the following procedure to perform the loopback test:

1 Use the *WaveStar*® CIT to log in to the near end Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Review the following test set considerations:

- Set the Destination Address to "Broadcast" (all Fs [FFFFFFFF}).
- Provision the test set data frames for the type of provisioned service being tested.
- Set the frame size to 1024 bytes.
- Set the transmission mode to send a single packet or to send a continuous stream at a rate much less than the interface and VCG rates.
- Make sure the VLAN tag is appropriate for the source and loopback ports.

3 For the circuit being tested, perform a terminal/facility loopback at the far-end node port. Select **Fault** → **Analysis** → **Loopback** from the System View menu at the far-end node. Expand the circuit pack details, select the port, then click **Select** at the bottom of the screen.

4 Verify the port AID, then select **Operate**. Click on **Apply** at the bottom of the window. Read the warning message, then click **Yes** to operate the command.

5 Connect the near end port to the Ethernet test set and start sending traffic.

6 Verify traffic is being received at the source node Ethernet test set.

7 Use the **Fault** → **Analysis** → **Loopback** command to release the loopback. Repeat this procedure for all circuits being tested.

END OF STEPS

Procedure 11-30: Enable/Disable LAN port transmission

Overview

Use this procedure to enable/disable LAN port transmission. Port Administration Control provides the capability to enable/disable the transmission of frames to or from a LAN port. When the port is disabled no new packets are received or transmitted.

Privilege level

You must login at least as a General or Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail the shelf slots, circuit packs, ports that are being enabled/disabled.

Steps

Use the following procedure to enable/disable LAN port transmission.

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Select the **Configuration** → **Equipment** from the System View menu. Select and expand the details for the circuit pack containing the LAN port. Highlight the LAN Port, then click **Select**.

3 **Important!** Disabling a LAN port will disable all frames to and from the port.

Click on the "Port Data" tab. For **Port Administration Control**, select **ENABLE** to enable the LAN port. Select **DISABLE** to disable the LAN port. Click **Apply**, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

END OF STEPS

Procedure 11-31: Provision Ethernet quality of service (QoS) - LNW70/LNW170

Overview

Use this procedure as a reference to provision Ethernet Quality of Service (QoS). Refer to the section at the end of these steps for a detailed overview.

Important! This procedure applies only to LNW70/LNW170 circuit packs.

To provision Ethernet Quality of Service for an LNW78, refer to Procedure 11-45: "Provision Ethernet quality of service (QoS) - LNW78" (p. 11-337).

Privilege level

You must login at least as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports, being provisioned.
- The type of QoS service being provisioned and all the related parameter values.

All the required regular Ethernet service parameters must have already been provisioned using the procedures in this chapter. This includes any packet rings, vlan tagging modes, customer vlan/port tags, virtual switches, and related LAN and VCG port parameters.

Steps

Use the following to provision a QoS service.

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Use the **Configuration** → **Equipment** command from the System View menu, select the circuit pack, then select the port being provisioned. Click on the **QoS** tab. Provision the parameters, as required. Or, use the **`ed-eport/ed-vcg`** TL1 commands to provision the port parameters.

Verify your settings, then click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

Repeat this step for each port in the network service.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70) or Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

3 Use the **Configuration** → **Data** → **Provision QoS Service** command from the System View menu, select the circuit pack, then select the port being provisioned. Or, use the **`ent-erate`** TL1 command to provision the QoS service parameters.

Verify your settings, then click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

Reference: Procedure 11-32: "Provision Ethernet QoS parameters" (p. 11-254)

END OF STEPS

Ethernet QoS

Use as a reference to provision Ethernet Quality of Service (QoS).

The Alcatel-Lucent 1665 DMX uses the differentiated services (DiffServ) model for the QoS feature. Traffic flow to the network is regulated only at the ingress ports.

The DiffServ model has two types of ports:

- Boundary port - port at the edge of the DiffServ domain.
- Interior port - port internal to the DiffServ domain.

A LAN/VCG port may be a boundary or interior port. Interior ports may not have a default VLAN ID or PortTag.

In addition to port types, ports may be assigned one of two port roles to control how tags are assigned/removed/processed:

- Customer port
- Network port

Selection of these port parameters may be done using the **`ed-eport`** and **`ed-vcg`** TL1 commands, or **Configuration** → **Equipment** from the *WaveStar*® CIT system menu, selecting the port, then clicking on the **QoS** tab. Select the **Port Type** and **Port Role**.

QoS Services/Traffic Management Modes

A basic QoS service is defined as a particular traffic flow that uses a single traffic conditioner. A number of services can be provisioned at a Boundary port. Interior ports do not have traffic conditioners. The configuration of these services is defined as one of five traffic management modes (**`trafmgmtmd`**) . The mode specifies how the packets will be

divided into traffic flows and the services that can be provided at the port. All services at one port must be in the same traffic management mode. The total number of QoS services on the LNW70/LNW170 circuit pack is 400.

The traffic management modes are defined as follows:

- PORT mode - Allowed in all VLAN tagging modes and in Private Line mode. One QoS service per port, when higher layer protocol classification is not used (ED-EPORT parameter hlayercos is NONE). One QoS service per cos value per port when hlayercos is set DSCP (not available in Private Line mode). Applies to both LAN and VCG ports.
- COSPORT mode - Allowed in 802.1TAG and TRANS mode. One QoS service and one TC for each Class of Service (CoS) at the port. Applies to both LAN and VCG ports.
- TAGPORT mode - Allowed only in 802.1TAG mode. One QoS service and one TC for each packet tag (802.1q or CID) at the port. All traffic received at the port that is tagged with the same VLAN ID is processed by a single traffic conditioner. Applies to both LAN and VCG ports.
- COSTAGPORT mode - Allowed only in 802.1TAG mode. One QoS service and one TC for each CoS for each packet tag at the port. Applies to both LAN and VCG ports.
- NOTC mode - Allowed in all VLAN tagging modes and in Private Line mode. In this mode all traffic is bridged through the switch as usual but there is no traffic conditioning performed on the traffic. NOTC mode emulates the (limited) QoS behavior on the older circuit packs (user_priority values 0 ,1, 2 and 3 are mapped to CoS 0 and user_priority values 4, 5, 6 and 7 are mapped to CoS 3; no modification of user_priority bits in user packets).

Selection of these port parameters may be done using the **`ed-eport`** and **`ed-vcg`** TL1 commands, or **Configuration** → **Equipment** from the *WaveStar*® CIT system menu, selecting the port, then clicking on the **QoS** tab. Select the Traffic Management Mode.

Classes of Service

Data packets classified at the ingress port result in unique traffic flows. Multiple flows can be mapped into a single Class of Service (COS). There may be up to four classes of service (CoS level 0, 1, 2, 3) supporting expedited forwarding (EF) and assured forwarding (AF) service. Class 3 supports expedited forwarding, low latency. Classes 0, 1, 2 support various degrees of assured, guaranteed, forwarding including best effort.

Selection of these parameters may be done using the **`ent/ed-erate`** TL1 commands, or **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT system menu, then selecting the port.

Traffic Conditioning

Traffic conditioning is performed on the ingress packets at Boundary Ports by metering the packets and either marking or policing as appropriate. This is used to enforce the guarantees and limitations specified in a Service Level Agreement (SLA). Within the

network, queueing and scheduling functions provide a network that is engineered to satisfy all of the attached customers' SLA requirements. There is no traffic conditioning on Interior ports.

Traffic Conditioner Parameters

Traffic Conditioner (TC) parameters include PIR, CIR, PBS, and CBS.

- PIR - Peak Information Rate. This is the peak information rate of the traffic conditioner function in Mbps. This is the PIR for the service addressed by the trafmgmtmd, port aid, tagid and cos. Value is from 0 to 10000. A value of 0 means that the PIR function is bypassed and there is no policing of the traffic. The value of PIR must be greater than or equal to CIR.
- CIR - Committed Information Rate. This is the committed information rate of the traffic conditioner function in Mbps for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is from 0 to 10000. The value of cir must be less than or equal to pir. A value of 0 means that there is no network commitment on incoming traffic. All traffic will be considered excess traffic
- PBS - Peak Burst Size. This is the peak burst size in kilobytes for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is from 1 to 255.
- CBS - Committed Burst Size. This is the committed burst size in kilobytes for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is from 1 to 255. The value of CBS must be less than or equal to PBS. In case of Private Line (vlantagmd set to NOTAG), the CBS value cannot be set (it inherits the PBS value).

Selection of these parameters may be done using the **`ent/ed-erate`** TL1 commands, or **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT system menu, then selecting the port.

Metering, Policing, and Color Marking

Metering measures the data rate with conformance levels determined by three color markers:

- Red - data rates greater than the PIR or PBS.
- Yellow - data rates less than or equal to PIR or PBS, but greater than CIR or CBS.
- Green - data rates less than or equal to CIR or CBS.

Policing discards red packets at the boundary ports. The remaining yellow and green packets determine drop precedence (DP).

Packets ingressing at boundary ports are remarked. Packets user priority is altered to reflect COS and DP. The COS is encoded in the 2 most significant bits in the user_priority field of the VLAN tag. The DP is encoded in the least significant bit in the user_priority field of the VLAN tag. In COSPORT or COSTAGPORT mode, user priority bit values map to the specified COS value. It is a map consisting of 8 elements left-to-right in increasing order of user priority, where each element specifies whether the user priority value maps to COS (1) or not (0).

The following bitmap shows which of the 8 user priority values map to the current COS:

- COS 0 - 01100000
- COS 1 - 10010000
- COS 2 - 00001100
- COS 3 - 00000011

In TAGPORT mode, the traffic class is set for all packets that ingress the port with a tagid and sets the COS value that will be inserted into the packet on entry into the DiffServ domain (that is, ingressing at a Boundary port). The COS value is inserted into the user_priority bits.

In PORT mode, the traffic class is set for all packets that ingress the port and the COS value is set based on the default priority of the port. The COS value is inserted into the packet on entry into the DiffServ domain (that is, ingressing at a Boundary port).

Selection of these parameters may be done using the **`ent/ed-erate`** TL1 commands, or **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT system menu, then selecting the port.

Queue Management

Each port supports configurable thresholds expressed as a percentage of the total queue allocation. Each queue is controlled by setting the size of the queues, the queue weights and the drop thresholds for yellow and green packets. The performance of each CoS level is controlled by setting the dropping probabilities for each CoS level. Traffic that was admitted into the network within the terms of a Service Level Agreement (SLA) can be differentiated and given preferential treatment at the queue in order to satisfy the SLA service guarantees.

Selection of these port parameters may be done using the **`ed-eport`** and **`ed-vcg`** TL1 commands, or **Configuration** → **Equipment** from the *WaveStar*® CIT system menu, selecting the port, then clicking on the **QoS** tab. Select the Traffic Management Mode.

The following TL1 command (*WaveStar*® CIT) parameters determine the maximum queue size and the minimum and maximum dropping thresholds for yellow and green packets:

- qsz - Maximum queue size. **Total Queue Size (in Kbytes)**
- qminthldg - Minimum dropping threshold for green packets. **Green Packet Min Drop Threshold (in %)**
- qmaxthldy - Maximum dropping threshold for yellow packets. **Yellow Packet Max Drop Threshold (in %)**
- qminthldy - Minimum dropping threshold for yellow packets. **Yellow Packet Min Drop Threshold (in %)**

The following TL1 command (*WaveStar*® CIT) parameters specify the weighting factor used by the queue service algorithm for the AF queue for packets coming from network or customer ports. EF packets are given strict priority over AF packets.

- qwt_ntwkAF - Weighting factor for the queue that serves AF packets from network ports. **Network Port AF Queue Weighting Factor**
- qwt_custAF - Weighting factor for the queue that serves AF packets from customer ports. **Customer Port AF Queue Weighting Factor**

The following TL1 command (*WaveStar*® CIT) parameters determine the maximum drop probability for COS 0, 1, 2, 3 packets:

- qdropwt0 - Specifies maximum drop probability for COS 0 packets. **CoS 0 Packets Drop Probability Mark (in %)**
- qdropwt1 - Specifies maximum drop probability for COS 1 packets. **CoS 1 Packets Drop Probability Mark (in %)**
- qdropwt2 - Specifies maximum drop probability for COS 2 packets. **CoS 2 Packets Drop Probability Mark (in %)**
- qdropwt3 - Specifies maximum drop probability for COS 3 packets. **CoS 3 Packets Drop Probability Mark (in %)**

Procedure 11-32: Provision Ethernet QoS parameters

Overview

This procedure provides a list of provisionable parameters for quality of service parameters set using the **`ent/ed-erate`** command, or selecting **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT System menu.

Also see Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248) and Procedure 11-45: "Provision Ethernet quality of service (QoS) - LNW78" (p. 11-337).

Important! For LNW70/LNW170 circuit packs, these parameters may apply to a VCG, an Ethernet LAN port, or a Link Aggregation Group (LAG). For LNW78 circuit packs, these parameters may apply to an Ethernet over SONET (EoS) VCG (v17 - v22) or an Ethernet LAN port.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for creating an Ethernet QoS service on circuit packs that support QoS services parameters.

1 Use the **`ent-erate`** TL1 command or select **Configuration** → **Data** → **Provision QoS Service** from the System View menu. Select the Ethernet circuit pack being provisioned, then click **Select**.

References: Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248)

Procedure 11-45: "Provision Ethernet quality of service (QoS) - LNW78" (p. 11-337)

2 Use Table 11-9, "ENT-ERATE command provisionable parameters" (p. 11-255) as reference to provision the necessary parameters from your work instructions.

END OF STEPS

ENT-ERATE command parameters

Table 11-9, "ENT-ERATE command provisionable parameters" (p. 11-255) lists the provisionable parameters for the Quality of Service (QoS):

Table 11-9 ENT-ERATE command provisionable parameters

Parameter	Description
tagid	**Tag ID**. Represents the VLAN ID in the 802.1TAG mode, or the Port Tag ID in the TRANS mode. Value: An integer in the range of 1 to 4093. If trafmgmtmd is set to PORT or COSPORT then tagid must be blank. If trafmgmtmd is set to TAGPORT or COSTAGPORT, then a valid numerical value for tagid must be entered and it must be a value that has been previously provisioned at the port. **tagid** must be blank on a LNW78 pack.

Table 11-9 ENT-ERATE command provisionable parameters (continued)

Parameter	Description
cos	The **CoS** parameter applies to the LNW70/LNW170 and the LNW78 circuit packs only. It specifies the class of service that the parameters in this command apply to. For the LNW70/LNW170, the allowed value is an integer between 0 and 3. • The value of 0 specifies CoS level 0. • The value of 1 specifies CoS level 1. • The value of 2 specifies CoS level 2. • The value of 3 specifies CoS level 3. For the LNW70/LNW170: • If **trafmgmtmd** is set to PORT and the ED-EPORT **hlayercos** is set to DSCP, then a valid **cos** must be entered. • If **trafmgmtmd** is set to PORT and the ED-EPORT **hlayercos** is set to NONE, then **cos** must be blank. • If **trafmgmtmd** is set to COSPORT or COSTAGPORT, then a valid numerical value for **cos** must be entered. For the LNW78, the allowed value is an integer between 1 and 3. • The value of 1 specifies CoS level 1 (Class C) • The value of 2 specifies CoS level 2 (Class B) • The value of 3 specifies CoS level 2 (Class A) For the LNW78: • If **trafmgmtmd** is set to PORT, then **cos** must be blank. • If **trafmgmtmd** is set to COSPORT, then a valid numerical value for **cos** must be entered.
cbs	**CBS**. Committed Burst Size. This is the committed burst size in kilobytes (1024 bytes) for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value: An integer in the range of 1 to 255. Default is 20. Default value is chosen because it guarantees that the burst size is at least the maximum frame size possible (when jumbo frames up to 10K are used). In case of Private Line (vlantagmd set to NOTAG), the cbs value cannot be set (it takes on the pbs value). On an LNW78, **cbs** cannot be set for CoS level 1.

Table 11-9 ENT-ERATE command provisionable parameters (continued)

Parameter	Description
cir	**CIR**. Committed Information Rate. This is the committed information rate of the traffic conditioner function in Mbps for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value: An integer in the range of 0 to 1000 for the LNW78. For the LNW70/LNW170, an integer in the range of 0 to 10000. Default value is 0. The value of cir must be less than or equal to pir. A value of 0 means that there is no network commitment on incoming traffic. All traffic will be considered excess traffic. A value above the port rate means that there is no policing of the traffic, traffic will flow unconditioned. In case of Private Line (vlantagmd set to NOTAG), the cir value cannot be set (it takes on the pir value) On an LNW78, **cir** cannot be set for CoS level 1.
pbs	**PBS**. Peak Burst Size. This is the peak burst size in kilobytes (1024 bytes) for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is an integer in the range of 1 to 255. Default value is 30. The value of pbs must be greater than or equal to cbs. The default value of 30 is chosen because it guarantees that the burst size is at least the maximum frame size possible (when jumbo frames up to 10K are used). On an LNW78, **pbs** cannot be set for CoS level 3.
pir	**PIR**. Peak Information Rate. This is the peak information rate of the traffic conditioner function in Mbps. This is the pir for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is an integer in the range of 0 to 10000 for the LNW70/LNW170. Default value is 10000. For the LNW78, value is an integer in the range of 0 to 1000 for the LNW70/LNW170. Default value is 1000. The value of pir must be greater than or equal to cir A value of 1000 (LNW78) or 10000 (LNW70/LNW170) means that there is no policing of the traffic, traffic will flow unconditioned. A value of 0 means that the traffic is halted, 0 Mbps. On an LNW78, **pir** cannot be set for CoS level 3.

Table 11-9 ENT-ERATE command provisionable parameters (continued)

Parameter	Description
qospm	**QoS PM**. Enables/Disables Performance Monitoring data collection for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Counters for the service will be re-initialized to 0 when qospm is toggled from DISABLE to ENABLE. Values: • ENABLE - QoS performance monitoring is enabled (initial value) • DISABLE - QoS performance monitoring disabled
dftpri2cos	**Default CoS**. This parameter sets the traffic class of all packets that ingress the port with tagid and sets the cos value that will be inserted into the packet prior to egressing the NE. The cos value will be inserted into the user_priority bits. This parameter is only applicable if the port pointed to by aid has trafmgmtmd set to TAGPORT. Values: Integers 0, 1, 2, 3. Default is 0.
userpri2cos	**User PB**. This parameter shows the user priority bit values that map to the specified cos value. It is a map consisting of 8 elements left-to-right in increasing order of user priority, where each element specifies whether the user priority value maps to the CoS (“1”) or not (“0”). Parameter is only valid is If Traffic Management Mode set to *COSPORT* or *COSTAGPORT*. Values allowed: A string of 8 characters from the set (“0”,”1”). Default value: • cos 0 : 01100000 • cos 1 : 10010000 • cos 2 : 00001100 • cos 3 : 00000011 This parameter does not apply to the LNW78 pack. The mapping is specified by IEEE 802.17a-2004.

Table 11-9 ENT-ERATE command provisionable parameters (continued)

Parameter	Description
dscp2cos	**Differentiated Services Code Point (DSCP) to associated CoS Level (cos) map**. This parameter lists the DSCP integer (six bits of the DS field) values that map to the specified cos value. This parameter is only applicable if the port pointed to by aid has trafmgmtmd set to PORT and hlayercos set to DSCP. Values: A list of integers between 0 and 64. The value 64 is used to classify non DSCP traffic to a cos. Any number can only be mapped to one service. Any DSCP value that is not mapped to a cos will default to CoS 0, even if cos 0 was not created using (ENT-ERATE). If value 64 (for non IP frames) is not assigned to a cos, it will be assigned by default to CoS 0. Default value: • cos 0 : 0-9&11&13&15&26&28&30&34&36&38&44&50&52&54&58&60&62 • cos 1 : 16-25&27&29&31 • cos 2 : 10&12&14&32&33&35&37&39&40&43&45&47&64 • cos 3 : 46&48&49&51&53&55-57&59&61&63 This parameter is only applicable to the LNW70/LNW170 pack.

Procedure 11-33: Provision LCAS, add/enable/remove tributaries

Overview

Use this procedure to enable/disable LCAS or add/enable/remove tributaries to LCAS-enabled VCGs.

LCAS allows for in-service hitless addition or removal of tributary members of a Virtual Concatenation Group (VCG) to vary its bandwidth. It also allows for automatic removal and restoration of failed members.

Tributary members may be any supported SONET tributary rate (e.g. STS-1, STS-Nc, VT1.5 tributaries) but never a mix of rates. When a trib is added which is tardier than current members, the entire VCG is retarded to allow it to join. This is accomplished by a temporary decrease in the output payload rate, while the current members are buffered for time-alignment.

The LCAS protocol is unidirectional in that the source side controls the hitless operations. The sink side only assists by indicating whether it is ready and acknowledging completion. This means that LCAS requires a return path for signaling from the sink back to the source. Single one-way cross-connections will not provide a return path. Therefore, for each span, two-way cross-connections must be made. Then, in order to be hitless, removal operations must be sequenced between the two ends, always starting at the source side of each unidirectional link.

Important! LCAS and this procedure apply only to LNW63, LNW64, LNW70/LNW170, LNW74, LNW87 and LNW78 Ethernet circuit packs. If only one end has LCAS enabled or the far end does not support LCAS, transmission operates normally in the non-LCAS mode. The standing condition NOTLCAS is generated when LCAS is enabled but the far end is detected as not supporting LCAS. It is cleared either when LCAS is disabled locally or the far end is detected to support LCAS.

Privilege level

You must login at least as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports, being provisioned.
- The network configuration and termination points.
- The number of tributaries being added or removed and related aids.

Steps

1 Determine the VCGs at each terminating end (source and sink) of the circuit being provisioned.

For example:

- Figure 11-50, "2-way cross-connections on a UPSR" (p. 11-266) illustrates a path protected OC-48 ring network with STS1 cross-connections for Ethernet service. In this example, VCG v1 at Node 1 and VCG v1 at Node 4 serve as the source/sink and sink/source for LCAS provisioning.

  Enabling LCAS requires that LCAS be Enabled for v1 at each terminating node.

  Adding tributaries requires that LCAS be Enabled, cross-connections made, and VCG membership enabled for each of the tributaries at the source and sink.

  Removing tributaries requires a distinct order of removal: Disable local source tributary, disable remote source and sink tributaries, disable local sink tributary. In this example, you would Disable the source (Input Membership) at VCG v1 at Node 1; Disable the source (Input Membership) and sink (Output Membership) at VCG v1 at Node 4; then Disable the sink (Output Membership) at VCG v1 at Node 1. Cross-connections for the disabled tributaries may then be removed as required.
- Figure 11-51, "Multipoint GbE cross-connections on a UPSR" (p. 11-267) illustrates an OC-48 ring network with multipoint STS1 cross-connections for Ethernet service. In this example, there are three separate links relating to LCAS provisioning. Note that at each add/drop node (Node 1, Node 5, and Node 4), two separate VCGs (v1 and v2) serve as both source and sink for LCAS provisioning.

  Enabling LCAS requires that LCAS be Enabled for both v1 and v2 at each terminating node.

  Adding tributaries requires that LCAS be Enabled, cross-connections made, and VCG membership enabled for each of the tributaries at all sources and sinks.

Removing tributaries requires a distinct order of removal: Disabling local source tributary, disabling remote source and sink tributaries, disabling local sink tributary. In this example, each individual link is treated separately. For example, in the link from Main 1 at Node 1 to Main 2 at Node 5, you would Disable the source (Input Membership) at VCG v1 at Node 1; Disable the source (Input Membership) and sink (Output Membership) at VCG v2 at Node 5; then Disable the sink (Output Membership) at VCG v1 at Node 1. Then, repeat the sequence for the link from Node 5 v1 to Node 4 v2, then from Node 4 v1 to Node 1 v2.

2

If ...	Then ...
you are disabling LCAS, or enabling LCAS for the first time,	continue with Step 3.
you are adding tributaries to an LCAS Enabled VCG,	proceed to Step 8.
you are enabling tributaries previously added to an LCAS Enabled VCG,	proceed to Step 10.
you are removing tributaries from an LCAS Enabled VCG,	proceed to Step 14.

3 *ENABLE/DISABLE LCAS FOR SELECTED VCGs*

Determine the VCGs at each end (source and sink) of the circuit being provisioned.

4 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelves.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

5 Use the **Configuration** → **Equipment** command from the System View menu, select the circuit pack, then select the VCG port being provisioned. Click **Select**.

Important! Changing between LCAS-Enabled to LCAS-Disabled on an in-service VCG may not be hitless.

6 Click on the **LCAS** tab. Provision the LCAS parameters, as required. Or, use the **ed-vcg** TL1 command to provision the LCAS parameters.

LCAS parameters:

- **LCAS Mode**: **ENABLE** (default) or **DISABLE** LCAS on the specified VCG.
- **Hold-Off Timer (in milliseconds)**: Specifies the delay time between when a tributary is detected faulty and when it is automatically removed from the VCG.
- **Wait-To-Restore (in seconds)**: Specifies the delay time between when a previously removed tributary is detected to be normal and when it is automatically returned to the VCG.

LCAS and non-LCAS interworking is supported but the change between LCAS enabled/disabled and LCAS disabled/enabled may not be hitless.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

7 Repeat from Step 4 for each VCG port being provisioned.

END OF STEPS TO ENABLE OR DISABLE LCAS.

8 *ADDING TRIBUTARIES*

Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf, as required.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9 Make all required pass-through and add/drop cross-connections, if not already performed.

The cross-connections providing transmission between the Source and Sink VCG's can occur at any time. Similarly the Source and Sink can be activated in any order. Only when all components are in place and enabled does the tributary member get added. Tributaries may be enabled (default) when the cross-connections are made or disabled and then enabled at a later time.

Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

END OF STEPS FOR ADDING TRIBUTARIES.

10 *ENABLING TRIBUTARIES*

Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf, as required.

11 Use the **Configuration** → **Equipment** command from the System View menu, select the Ethernet circuit pack, select the VCG port, then select the tributary (Trib) being provisioned. Click **Select**.

Or, use the **ed-vcgtrib** TL1 command to provision parameters.

12 In the Tributary provisioning screen, select **Enabled** for the **VCG Membership** for both the **Input** (Source) and **Output Direction** (sink).

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

13 Repeat from Step 10 to Enable Membership for each Tributary at each VCG in each add/drop node in the configuration.

In a multipoint configuration, it is suggested that tributary membership be added at both ends on one link before moving to the next link.

END OF STEPS FOR ENABLING TRIBUTARIES.

14



NOTICE

Service-disruption hazard

Service hits may occur if the proper sequence is not followed when removing tributaries from an LCAS enabled system.

REMOVING TRIBUTARIES

Use the *WaveStar*® CIT to log in to the near-end Alcatel-Lucent 1665 DMX shelf, as required.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

15 From the System View menu, use the **Configuration** → **Equipment** command from the System View menu, select the Ethernet circuit pack, select the VCG port, then select the tributary (Trib) being removed. Click **Select**.

Or, use the **ed-vcgtrib** TL1 command to provision parameters.

16 In the Tributary provisioning screen, select **Disabled** for the **VCG Membership** for the **Input Direction** (Source).

17 Use the *WaveStar*® CIT to log in to the far-end Alcatel-Lucent 1665 DMX shelf terminating the link.

18 From the System View menu, use the **Configuration** → **Equipment** command from the System View menu, select the Ethernet circuit pack, select the VCG port, then select the tributary (Trib) being removed. Click **Select**.

Or, use the **ed-vcgtrib** TL1 command to provision parameters.

19 In the Tributary provisioning screen, select **Disabled** for the **VCG Membership** for both the **Output Direction** (Sink) and **Input Direction** (source).

20 Use the *WaveStar*® CIT to log back in to the near-end Alcatel-Lucent 1665 DMX shelf in which you started.

21 From the System View menu, use the **Configuration** → **Equipment** command from the System View menu, select the Ethernet circuit pack, select the VCG port, then select the tributary (Trib) being removed. Click **Select**.

Or, use the **ed-vcgtrib** TL1 command to provision parameters.

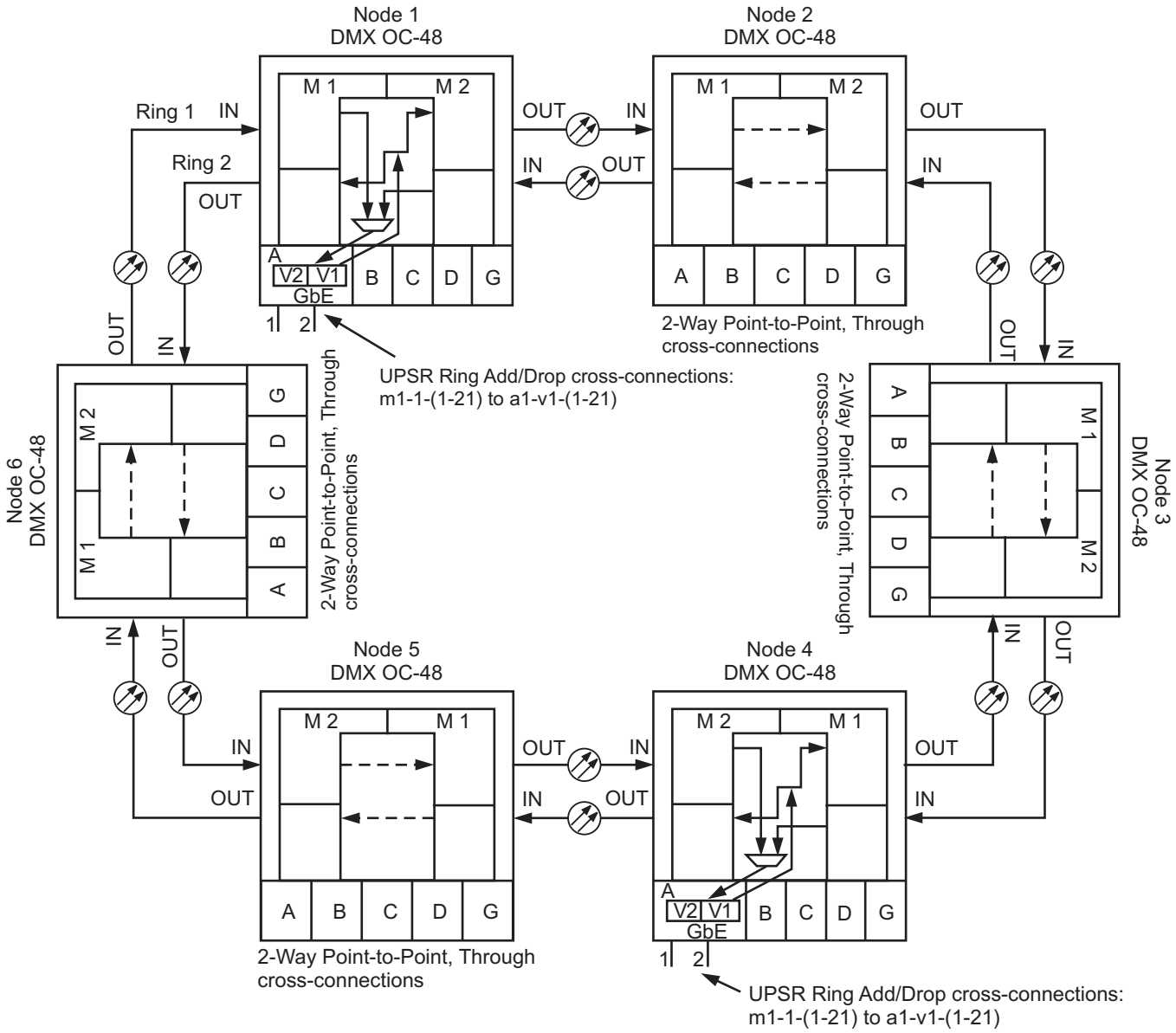
22 In the Tributary provisioning screen, select **Disabled** for the **VCG Membership** for the **Output Direction** (Sink).

23 If you are removing tributaries in a multipoint configuration, repeat from Step 14 for each link having tributaries removed. Repeat these steps for all other tributaries being removed.

24 If required, remove all pass-through and terminating cross-connections relating to the removed tributaries.

END OF STEPS

Figure 11-50 2-way cross-connections on a UPSR

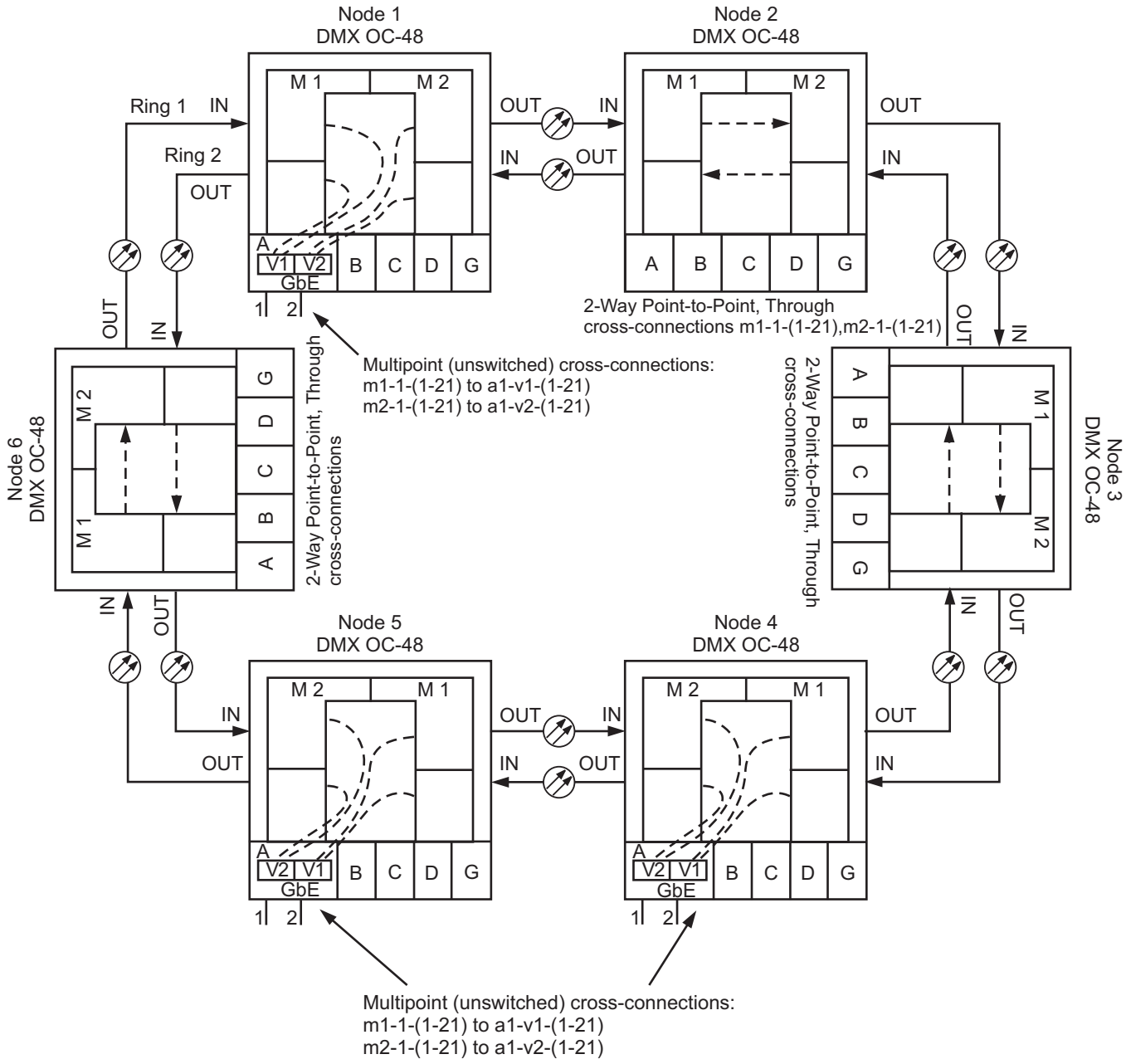


Example: Pass through cross-connections at Nodes 2,3,5, and 6:
m1-1-(1-21),m2-1-(1-21)

DMX = 1665 Data Multiplexer

NC-DMX-086-2

Figure 11-51 Multipoint GbE cross-connections on a UPSR



DMX = 1665 Data Multiplexer

NC-DMX-084-2

Procedure 11-34: Establish LNW74 10/100-T/F enhanced Fast Ethernet private line service on UPSR

Overview

This procedure provides examples for:

- Configuring point-to-point UPSR protected fast Ethernet private line service using the LNW74 10/100-T/F Enhanced Private Line Ethernet circuit pack. See Figure 11-52, "Point-to-Point 10/100-T/F private line service, three STS1s" (p. 11-273), Figure 11-53, "Two point-to-point 10/100-T/F private line services, STS1 and STS3c" (p. 11-274), and Figure 11-54, "Two point-to-point 10/100-T/F private line services, STS3c and VT1.5" (p. 11-275) for examples.
  - Figure 11-52, "Point-to-Point 10/100-T/F private line service, three STS1s" (p. 11-273) illustrates a UPSR protected point-to-point private line service using three STS-1 cross-connections.
  - Figure 11-53, "Two point-to-point 10/100-T/F private line services, STS1 and STS3c" (p. 11-274) illustrates two UPSR protected point-to-point private line services using STS1 and STS3c cross-connections.
  - Figure 11-54, "Two point-to-point 10/100-T/F private line services, STS3c and VT1.5" (p. 11-275) illustrates two UPSR protected point-to-point private line services using VT Virtual Concatenation and STS3c and VT1.5 cross-connections.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. If you prefer, you can use the Data Provisioning Wizard to perform the provisioning in this procedure. From the System View menu, select **Configuration** → **Ethernet Service** to invoke the wizard.

Important! If the LNW74 10/100-T/F circuit pack is being used in Function groups A, B, or C and the Main slots are equipped with LNW26B OC-48 OLIUs or functionally equivalent OLIUs with PWDM compatible optics, then only 24 STS-1s are available for cross-connections.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.

Steps

Use this procedure as an example for configuring fast Ethernet private line service. See Figures for examples.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Important! When the LNW74 is installed in Growth group slot, only optical ports 17-24 may be used.

Reference: Procedure 4-12: "Install 10/100 Ethernet circuit packs" (p. 4-61)

6 **Important!** If the Ethernet circuit pack is already in service, the existing VT Virtual Concatenation mode cannot be changed without removing all existing VCG VT1.5 cross-connections.

CONFIGURE VT VIRTUAL CONCATENATION MODE

Determine the existing VT Virtual Concatenation mode for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VT Virtual Concatenation mode.

7 If required, use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

8 Verify/Select the **VT Virtual Concatenation** mode (**`0`** or **`12`**). Click **OK**, read the warning message, then click **Yes** to execute the command.

When **`12`** is selected as the VT Virtual Concatenation mode, 12 STS-1s are reserved for VT1.5 concatenation. Up to 336 VT1.5s may be assigned to the circuit pack with between 0 and 63 assigned to any VCG. Only 36 STS-1s are then available for STS-1 concatenation or STS-3Cs.

When 0 is selected as the VT Virtual Concatenation mode, there is no VT mapping and all 48 STS-1s are available for STS-1 concatenation or STS-3Cs.

9 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! The LNW74 supports tributary rates of VT1.5 VCAT, STS-1, or STS-3c cross-connections independently to each VCG. Up to 63 VT1.5s may be assigned to any VCG if VT Virtual Concatenation mode is set to 12. Any VCG may be assigned 1, 2 or 3 STS-1s. Any VCG may be assigned an STS-3c up to a maximum of 16 for the circuit pack. Ports may be provisioned until all the available 48 STS-1 equivalents (including 336 VT1.5s) are used.

10 One at a time at each *non* terminating node in the network, use the TL1 **`ent-crs-sts1`**,**`ent-crs-vt1`**, or **`ent-crs-sts3c`** command to provision the pass-through cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

11 One at a time at each terminating node in the network, use the TL1 **ent-crs-sts1**,**ent-crs-vt1**, or **ent-crs-sts3c** command to provision the add/drop cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204)

12 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

13 **Important!** For LNW70/LNW170/74 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG.

Use the TL1 **ed-vcgtrib** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **Enabled** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

14 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

15 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

16 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

17 Click **Apply**. Read the warning message, then click **Yes** to execute the command.

18 PROVISION VCGS

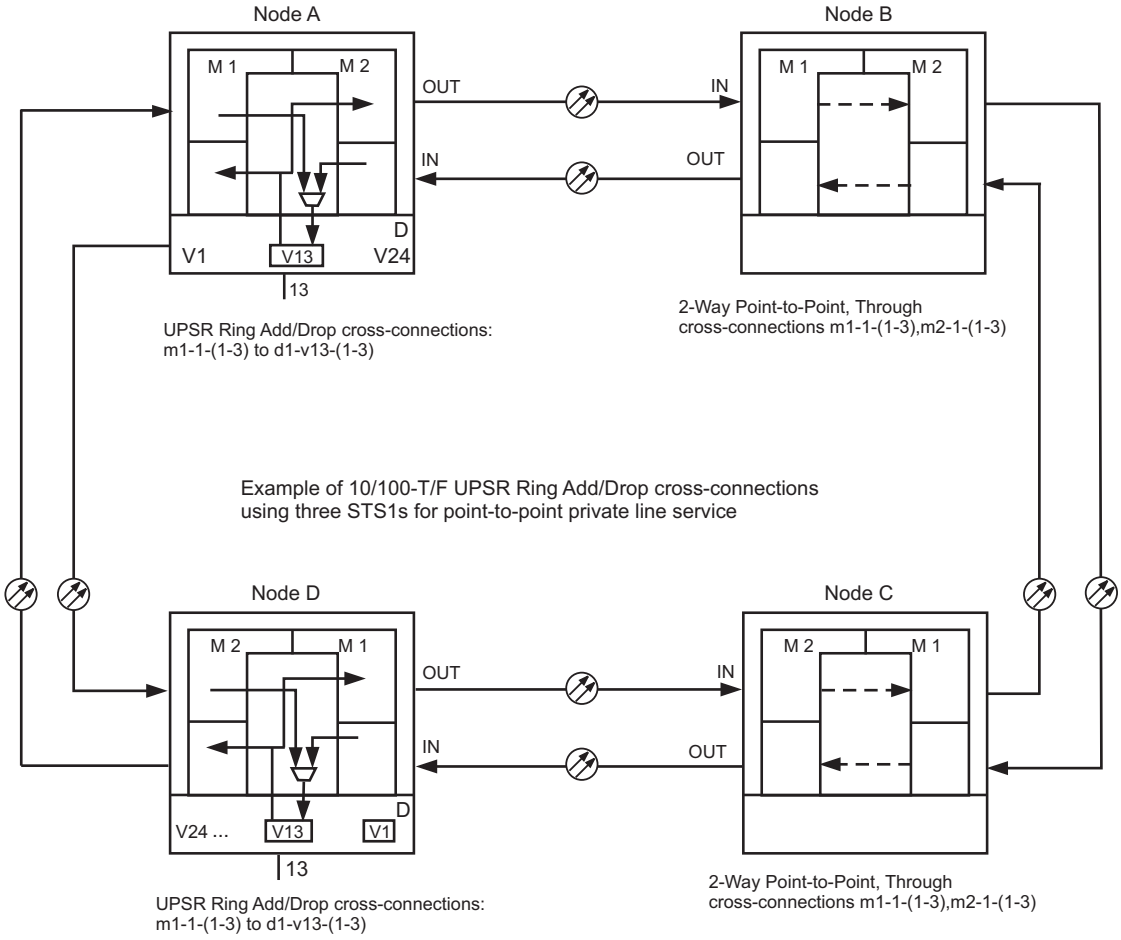
Use the **`ed-vcg`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the prevision step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

19 Click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit or repeat from Step 16 for other port provisioning.

END OF STEPS

Figure 11-52 Point-to-Point 10/100-T/F private line service, three STS1s



MA-DMX-411-2

Figure 11-53 Two point-to-point 10/100-T/F private line services, STS1 and STS3c

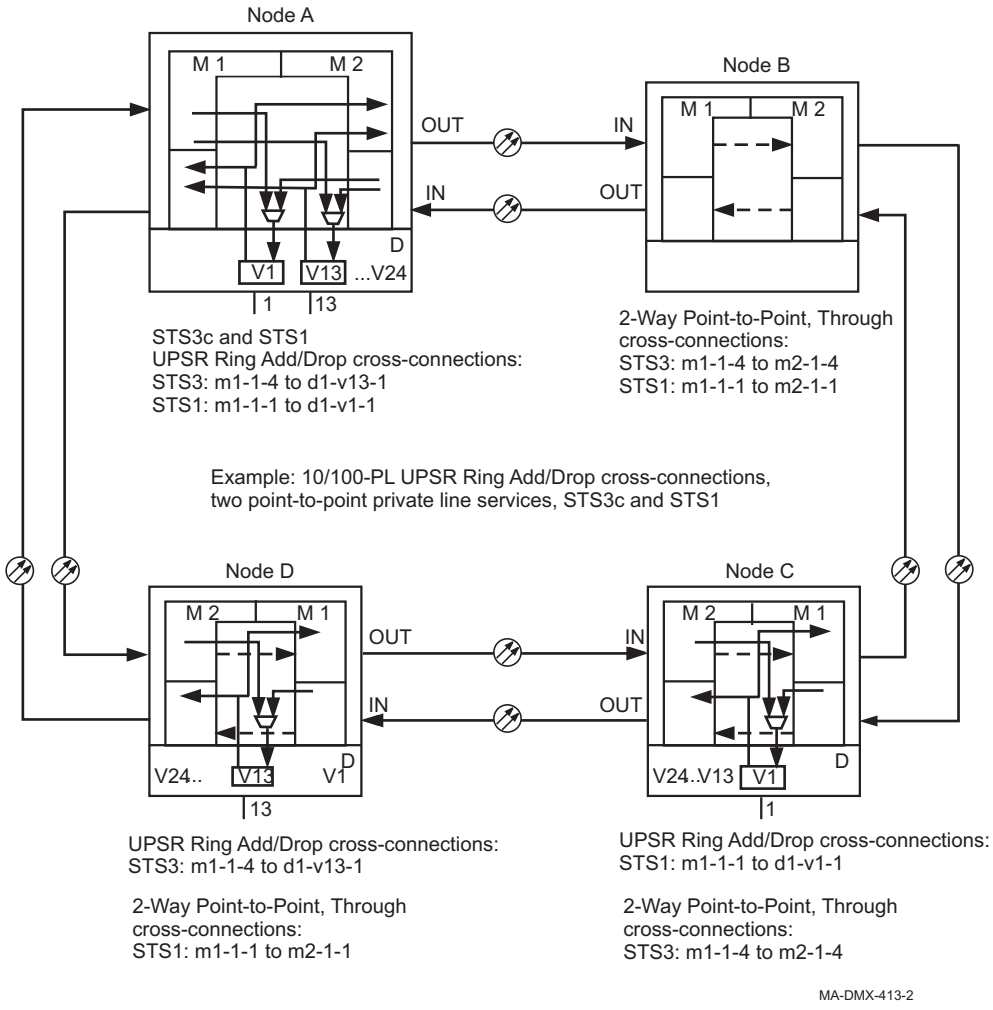
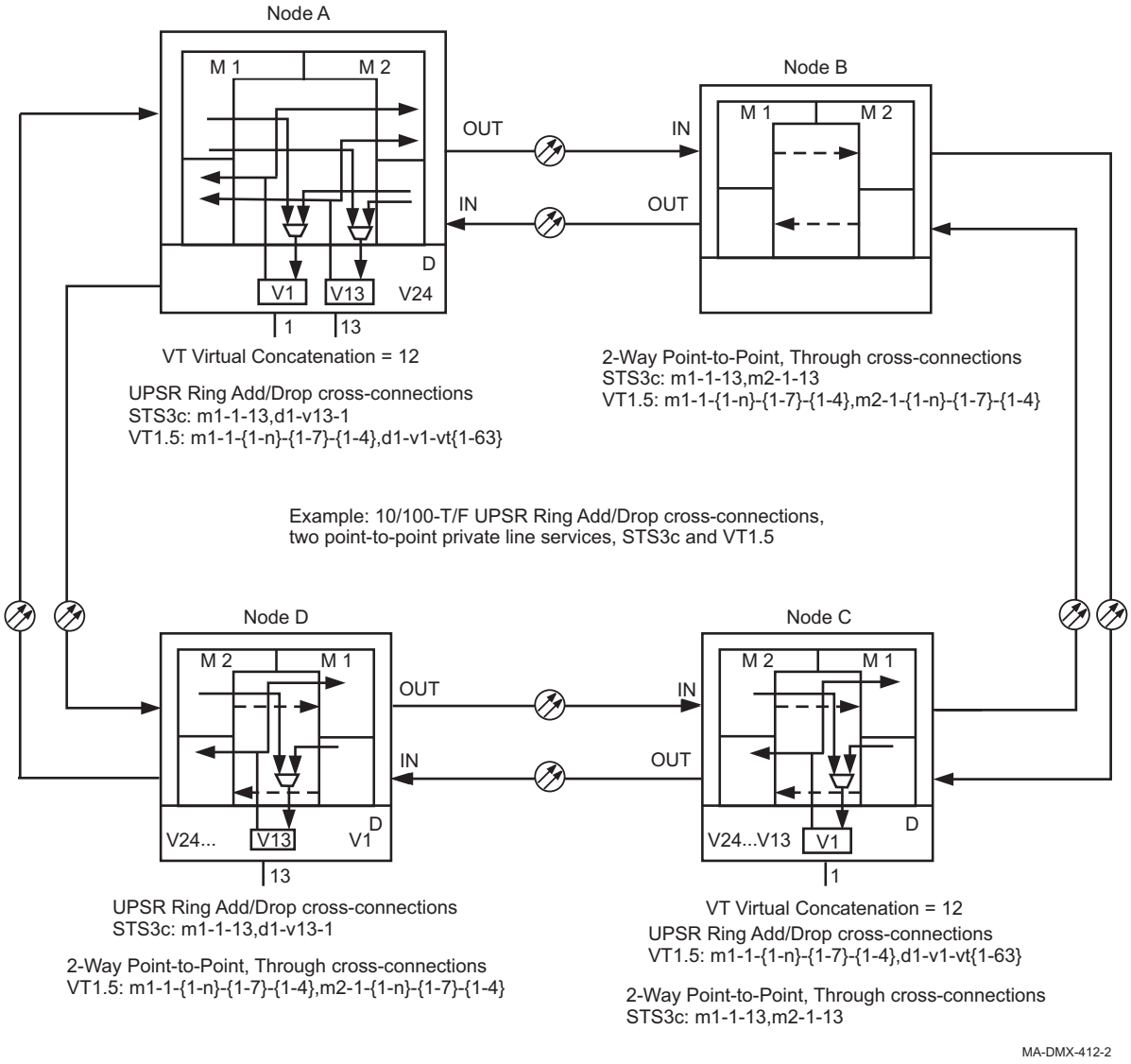


Figure 11-54 Two point-to-point 10/100-T/F private line services, STS3c and VT1.5



Procedure 11-35: Establish LNW73/LNW73C FC-DPORT SAN transport service on UPSR

Overview

This procedure provides an example for configuring SAN transport service using the LNW73/LNW73C circuit pack. Figure 11-55, "Point-to-point Fibre Channel service" (p. 11-281) illustrates a two-way point to point Fibre Channel service transport over a SONET UPSR ring.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters.

Important! If the LNW73/LNW73C FC-DPORT circuit pack is being used in Function groups A, B, or C and the Main slots are equipped with LNW26B OC-48 OLIUs or functionally equivalent OLIUs with PWDM compatible optics, then only 24 STS-1s are available for cross-connections.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.

Steps

Use this procedure as an example for configuring SAN transport service. See Figure for example.

1 Use the *WaveStar*® CIT to log in to the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the service to be established.

5 Verify that the Fibre Channel (FC) circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing service.

Reference: Procedure 4-17: “Install Fibre Channel circuit packs” (p. 4-102)

6 Verify that the correct pluggable transmission modules have been installed for the ports being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, expand the details for the Fibre Channel (FC) circuit pack. Select the pluggable transmission modules for the port being provisioned, then click **Select**.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

7 **Important!** If the LNW73/LNW73C Fibre Channel circuit pack is already in service, the existing Data Type cannot be changed without removing all existing VCG cross-connections.

PROVISION CIRCUIT PACK DATA TYPE

Determine the existing Data Type for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the Data Type.

8 If required, use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

Reference: Procedure 11-36: “Provision LNW73/LNW73C FC-DPORT circuit pack parameters” (p. 11-282)

9 Verify/Select the **Data Type** (**`FC-FICON`** or **`ESCON`**). Click **Apply**, click **`Close`** to exit.

10 PROVISION CIRCUIT PACK PORT(S)

Use the TL1 **`ed-dport`** command or select the **Configuration** → **Equipment** command from the System View menu, expand details for the circuit pack being provisioned. Select the port being provisioned, then click **Select**. Provision port parameters as required.

Reference: Procedure 11-37: “Provision FC-DPORT DATA port parameters” (p. 11-284)

11 Click **Apply**, then click **Yes** to the warning message to execute the command. Click **Close** to exit.

12 PROVISION VCGS

Use the **`ed-vcg-data`** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, if window is not already open from the previous step. Expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-38: “Provision FC-DPORT VCG parameters” (p. 11-288)

13 Click **Apply**, then click **Yes**, if required, to the warning message to execute the command. Click **Close** to exit.

14 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating and non terminating node in the network.

Important! The rate and type of cross-connections made depend on the circuit pack Data Type setting (FC-FICON or ESCON) or the port GFP Enscapsulation Type setting (FC, FICON, or ASYNC-FC) when the circuit pack Data Type setting is set to FC-FICON. **Virtual Concatenation Mode** must be **`Enabled`** for each VCG requiring more than one cross-connection.

Reference: Procedure 11-38: "Provision FC-DPORT VCG parameters" (p. 11-288)

Reference: "Cross-Connections for LNW73/LNW73C FC-DPORT" (p. 11-293)

15 One at a time at each *non* terminating node in the network, use the TL1 **`ent-crs-sts1`**,**`ent-crs-sts3c`**, or **`ent-crs-sts12c`** command to provision the pass-through cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Important! Note that cross-connections at the terminating nodes are add/drop and cross-connections at the non terminating nodes are pass-through.

Reference: Procedure 11-39: "Make cross-connections for LNW73/LNW73C FC-DPORT SAN transport service" (p. 11-291)

16 One at a time at each terminating node in the network, use the TL1 **`ent-crs-sts1`**,**`ent-crs-sts3c`**, or **`ent-crs-sts12c`** command to provision the add/drop cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each of the nodes in the network to provision the cross-connections.

Reference: Procedure 11-39: "Make cross-connections for LNW73/LNW73C FC-DPORT SAN transport service" (p. 11-291)

17 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

18 **Important!** Each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in the Input or Output Direction, as required.

Use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

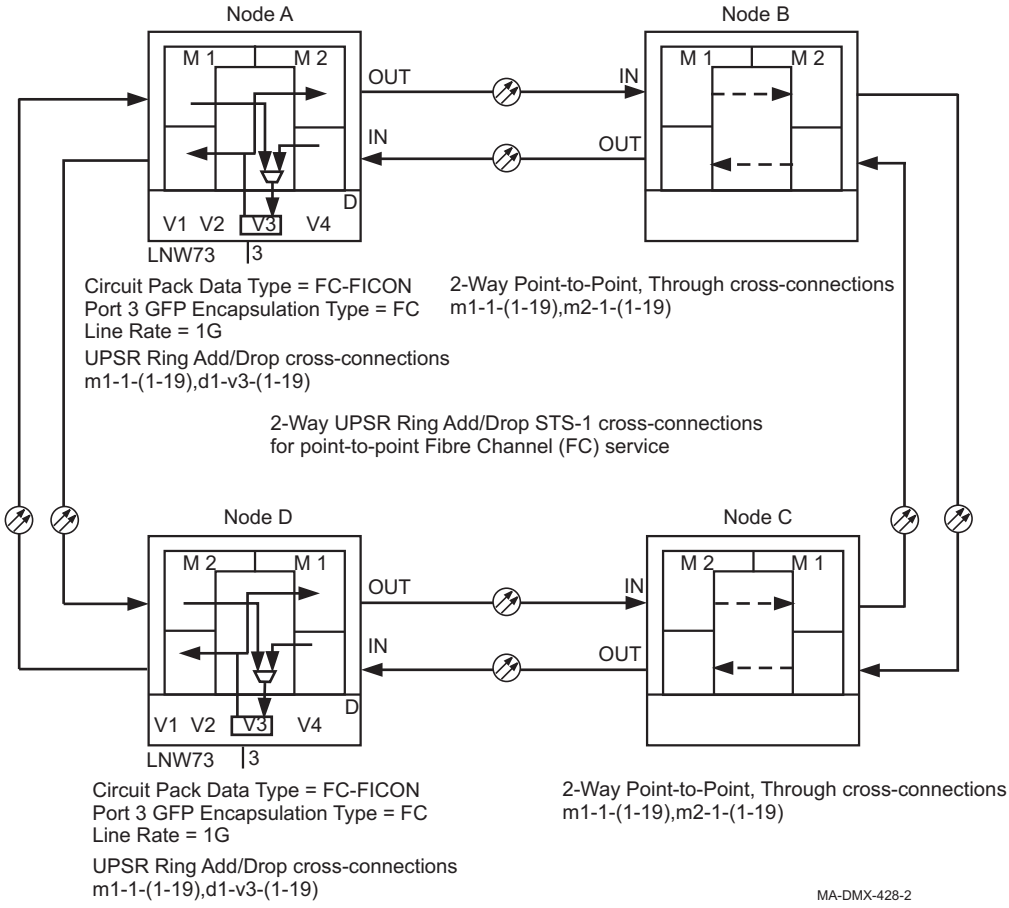
19 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

20 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Figure 11-55 Point-to-point Fibre Channel service



Procedure 11-36: Provision LNW73/LNW73C FC-DPORT circuit pack parameters

Overview

This procedure provides a list of provisionable parameters for Data circuit packs.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisioning Data circuit pack parameters.

1 Use the **ed-eqpt** TL1 command or select **Configuration** → **Equipment** from the System View menu. Select the FC Data circuit pack being provisioned, then click **Select**.

2 Use Table 11-10, "ED-EQPT command provisionable parameters" (p. 11-282) as reference to provision the necessary parameters from your work instructions.

END OF STEPS

ED-EQPT command parameters

Table 11-10, "ED-EQPT command provisionable parameters" (p. 11-282) lists the provisionable parameters for the Data circuit packs:

Table 11-10 ED-EQPT command provisionable parameters

Parameter	Description
type	**Equipment Type**When addressed to a slot AID, the legal value is DATA (Ethernet circuit pack). Other values are valid when the slot is not equipped with a Data pack.

Table 11-10 ED-EQPT command provisionable parameters (continued)

Parameter	Description
datatype	**Data Type**. Sets the protocol data type for the circuit pack. Values for **Data Type**: • **FC-FICON** — Fibre Channel (FC) and Fiber Connection (FICON). In this mode, data ports can be configured individually for FC or FICON. • **ESCON** — Enterprise Systems Connection (ESCON). In this mode, all ports on the circuit pack are set for ESCON. Changing the value of datatype will cause the target data circuit pack to reset, which may take up to several minutes to complete. Until the pack reset is complete, subsequent provisioning commands directed toward the pack may not complete and may cause a transient pack failure. This parameter cannot be changed if there are any existing cross connections or loopbacks. This parameter applies only to the LNW73/LNW73C circuit pack.

Procedure 11-37: Provision FC-DPORT DATA port parameters

Overview

This procedure provides a list of provisionable parameters for the LNW73/LNW73C FC-DPORT ports.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisionable DATA port parameters.

1 Use the **ed-dport** TL1 command or select **Configuration** → **Equipment** from the System View menu for the majority of parameters. Expand the details for the circuit pack, select (highlight) the DATA Port, then click **Select**.

Result: Exceptions to provisioning parameters from the **Configuration** → **Equipment** command will be noted in this procedure.

Reference: Appendix A, "Provisionable parameters"

2 Use Table 11-11, "ED-DPORT command provisionable parameters" (p. 11-285) as reference to provision the necessary DATA port parameters from your work instructions.

Important! Some of the parameters may have already been provisioned from earlier procedures for establishing service.

3 Use Procedure 6-10: "Assign alarm severity assignment profile" (p. 6-39) as a reference to provision ASAPs.

END OF STEPS

ED-DPORT command parameters

Table 11-11, "ED-DPORT command provisionable parameters" (p. 11-285) lists the provisionable parameters for the **ed-dport** command:

Table 11-11 ED-DPORT command provisionable parameters

Parameter	Description
epmode	**Port Monitoring Mode** may have one of the following values: • AUTO (initial value) • NMON (not monitored) • IS (monitored) When a port is provisioned in the AUTO state, it will automatically transition to the in-service (IS) state upon detection on the port of a valid input.
eppm	**Data Port PM Enable**. Use the **Performance** → **Prov PM Settings** command from the System View menu to set this performance monitoring parameter to one of the following values: • Enable (initial value) • Disable This parameter controls whether performance monitoring is enabled or disabled for the specified port.
tcamd	**TCA Monitoring Mode**. This parameter specifies whether performance monitoring Threshold Crossing Alert reporting is enabled or disabled for the port. Use the **Performance** → **Prov PM Settings** command from the System View menu to set this performance monitoring parameter to one of the following values: • Enable • Disable (initial value) TCA reporting will not begin until *tcamd* is enabled and port monitoring mode is enabled (*eppm* = Enabled), and the port is in service (*epmode* = IS).
lnrate	**Line Rate**. This parameter sets the line rate of the addressed port(s). This parameter is valid when the circuit pack **Data Type** is set to **FC-FICON**. Values: • **1G** - 1.0625 Gbps (initial value) • **2G** - 2.1250 Gbps. 2G rate is only supported on ports 1 and 3. In order to set port 1 to 2G, port 2 must not have a cross-connection and is unused. In order to set port 3 to 2G, port 4 must not have a cross-connection and is unused.

Table 11-11 ED-DPORT command provisionable parameters (continued)

Parameter	Description
admin	**Port Administration Control**. This parameter is used to enable/disable a port. It will enable/disable all frames to and from a port. Values: • ENABLE - Enables frames to/from port. • DISABLE - Disables frames to/from port.
rcf	**Remote Client Fail**. This parameter enables/disables Remote Client Fail message detection and generation. Values: • ENABLE - Enables Remote Client Fail message (Initial Value) • DISABLE - Disables Remote Client Fail message. This parameter must be enabled at both ends of the circuit in order to function.
rcf-linkdown	**Remote Client Fail Link Shutdown**. When rcf is enabled, this parameter controls link shutdown by Remote Client Fail message reception. Values: • ENABLE - Enables link shutdown (Initial Value) • DISABLE - Disables link shutdown. Link Loss Return (LLR) is a feature on some external equipment. External equipment with LLR enabled will stop sending link pulses back to the LNW73/LNW73C if the LNW73/LNW73C has stopped transmitting link pulses to the external equipment due to a link shutdown performed by the Remote Client Fail Link Shutdown feature. Therefore, when the LNW73/LNW73C is connected to equipment that has the Link Loss Return feature enabled, the Remote Client Fail Link Shutdown (rcf-linkdown) option should be disabled to avoid a link shutdown locking problem. Customers planning to use the CSF feature with RCF-Linkdown enabled should disable LLR on the external equipment.
gfptype	**GFP Encapsulation Type**. This parameter sets the User Payload Identifier for GFP Client Frames. This parameter is valid when the circuit pack **Data Type** is set to **`FC-FICON`**. Values: • **`FC`** - Transparent Fibre Channel (initial value) Used for synchronous full rate • **`FICON`** - Transparent FICON. Used for synchronous full rate. • **`ASYNC-FC`** - Asynchronous Transparent Fibre Channel. Used for full and sub-rate rate, supports distance extension. (LNW73/73C only)

Table 11-11 ED-DPORT command provisionable parameters (continued)

Parameter	Description
sync_ping	**Synchronous Ping**. This parameter enables/disables WAN ping in synchronous GFP. This parameter is valid when port*gfptype* is set to **FC** or **FICON** or when the circuit pack **Data Type** is set to **ESCON**. Values: • **Enable** - Enables pinging. Enabling this parameter allows the measurement of the WAN propagation delay. Delay is retrievable by prop_delay in RTRV-DPORT or by Propagation Delay in **View** → **Data** → **Ethernet/Data/VCG Port**. • **Disable** - Disables pinging (initial value).
compr	**Data Compression**. This parameter enables/disables data compression provisioning on an LNW73C port. This parameter is valid when port *gfptype* is set to **async-FC**. Values: • **Enable** - Enables data compression. Note: Data Compression is operational if both ends are provisioned for compression, cross-connections are provisioned across the network, and vcgtribs are enabled in both directions. The data compression operational status, **compro**, will only become enabled when the VCG is operational between both ends (Data Port Status [pstat] value is **TRANS** [Transparent Operation] or **PRT-LNK-INIT** [Port Link Initialization]) and the BB Credit settings on the attached Fibre Channel device is set for 8 or fewer credits. • **Disable** - Disables data compression (initial value).

Procedure 11-38: Provision FC-DPORT VCG parameters

Overview

This procedure provides a list of provisionable parameters for virtual concatenation groups (VCGs) on the LNW73/LNW73C FC-DPORT circuit pack.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisioning VCG parameters.

1 Use the **`ed-vcg-data`** TL1 command or select **Configuration** → **Equipment** from the System View menu for the majority of parameters. Expand the details for the circuit pack, select (highlight) the VCG port, then click **Select**.

Result: Exceptions to provisioning parameters from the **Configuration** → **Equipment** command will be noted in this procedure.

Reference: Appendix A, "Provisionable parameters"

2 Use Table 11-12, "ED-VCG-DATA command provisionable parameters" (p. 11-289) as reference to provision the necessary parameters from your work instructions.

Important! Some of the parameters may have already been provisioned from earlier procedures for establishing service or packet rings.

END OF STEPS

ED-VCG-DATA command parameters

Table 11-12, "ED-VCG-DATA command provisionable parameters" (p. 11-289) lists the provisionable parameters for the ed-vcg-data command:

Table 11-12 ED-VCG-DATA command provisionable parameters

Parameter	Description
vmode	**VCG Monitoring Mode** may have one of the following values: • AUTO - port automatically goes in-service (IS) when a valid input is received. Initial value. • NMON (not monitored)
vpm	**VCG PM Enable**. This parameter controls when performance monitoring is enabled for the specified VCG. Use the **Performance** → **Prov PM Settings** command from the System View menu to set this performance monitoring parameter to one of the following values: • Enable (initial value) • Disable
lcasmd	**LCAS Mode**. This parameter controls whether LCAS (Link Capacity Adjustment Scheme) is enabled for the specified VCG. When enabled, the LCAS protocol allows for hitless changes to the provisioned size of the VCG. Values for LCAS Mode include: • ENABLE • DISABLE (initial value) Note that ENABLE is valid only when **gfptype** (in RTRV-DPORT) is **ASYNC-FC**.
htmr	**Hold-Off Timer**. This parameter, which is only in effect if **lcasmd** = ENABLE, specifies the delay between when a tributary is detected faulty and when it is automatically removed from the VCG. It allows underlying protection, if any, to react first. It applies to all tributaries in the specified VCG. Values: • 0 to 10,000 ms (10 sec), in 100 millisecond steps • 99,999 ms (representing infinity) Initial value is 200 milliseconds.
wtr	**Wait-to-Restore**. This parameter, which is only in effect if **lcasmd** = ENABLE, specifies the delay between when a tributary, previously removed from the VCG because of fault, is detected to be normal and when it is automatically returned to the VCG. It applies to all tributaries in the specified VCG. Values: 0 to 3600 seconds in 1 second steps. Initial value = 5.

Table 11-12 ED-VCG-DATA command provisionable parameters (continued)

Parameter	Description
vcat	**Virtual Concatenation Mode**. Specifies whether H4 is inserted/monitored for the specified VCG. It has effect only when a single trib, not VT, is cross-connected to the VCG, to allow interworking with non-VCAT equipment. Valid values are • ENABLE (default) • DISABLE

Procedure 11-39: Make cross-connections for LNW73/LNW73C FC-DPORT SAN transport service

Overview

This procedure provides examples for making cross-connections for SAN transport service using the LNW73/LNW73C circuit pack.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Steps

Use this procedure as an example for making cross-connections for SAN transport service.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Access each of the NEs identified and select the **Administration** → **OSI Neighbor Map** command and note the NEs connected to Main 1 and Main 2.

Repeat the above until the backbone ring can be sketched.

For BLSR rings, you can select **View** → **Rings** → **Ring Map** from the System View menu, then select the 2F BLSR port protection group and click **Select**. Select NVMRING in the Ring Map Source selection box. You may also Display Ring Map Graph using this command.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

Result: The *OSI Neighbor Map* window opens if the **Administration** → **OSI Neighbor Map** command was used.

A list of NEs and NE neighbors is displayed if the **View** → **Rings** → **Ring Map** command was used.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the cross-connections to be made at each node associated with the service to be established.

Figure 11-59, "Point-to-point Fibre Channel service" (p. 11-297) illustrates the cross-connection rate, type, and STSn AID addresses when using the Cross-Connection Wizard.

5 Starting at one of the nodes in the ring for the circuit being established, select **View** → **Cross-Connections** at each node in the ring to verify that the cross-connections specified on the work instructions may be made.

If cross-connections are already assigned or improperly assigned, refer trouble to the provisioning organization. Improperly assigned cross-connections may have to be deleted, or a different timeslot must be selected for the service being selected.

6 One at a time, at each *non* terminating node, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at all *non* terminating nodes in the network to provision the STSn pass-through cross-connections for the Ethernet service being provided.

Reference: "Cross-Connections for LNW73/LNW73C FC-DPORT" (p. 11-293)

7 One at a time, at each terminating node, select **Configuration** → **Cross-Connections** from the **System View** menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at all terminating nodes in the network to provision the STSn add/drop cross-connections.

Reference: "Cross-Connections for LNW73/LNW73C FC-DPORT" (p. 11-293)

8 From the System View menu, select **View** → **Cross-Connections** at each node to verify that the proper connections have been made.

9 After all cross-connections are made, click on the **Alarm List** button on the System View window and verify no alarms are present.

10 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Cross-Connections for LNW73/LNW73C FC-DPORT

The rate and type of VCG cross-connections made depend on the circuit pack Data Type setting (FC-FICON or ESCON) or the port GFP Enscapsulation Type setting (FC, FICON, or ASYNC-FC) when the circuit pack Data Type setting is set to FC-FICON.

Data Type: **ESCON**

Whan Data Type is set to **ESCON** (Enterprise Systems Connection) all ports on the circuit pack support only ESCON.

ESCON mode supports only full-rate service requiring a minimum of 4 STS-1s (6 STS-1s may be required for other vendor equipment), or 2 STS-3c, or 1 STS-12c cross-connections. The ports will not carry any traffic end-to-end unless the full rate is provisioned.

Data Type: **FC-FICON**

When Data Type is set to **FC-FICON**, individual port **GFP Encapsulation Type** may be provisioned to support three separate data protocols:

- **FC** (Fibre Channel) - Supports full-rate 1Gbs (**1G**) or 2Gbs (**2G**) service using STS-1 or STS-3c cross-connections. The ports will not carry any traffic end-to-end unless the full rate is provisioned.
  - **Line Rate**: **1G** - Full-rate 1G service requires a minimum of 19 STS-1s or 6 STS-3c (7 STS-3c may be required for other vendor equipment) cross-connections.
  - **Line Rate**: **2G** - Full-rate 2G service requires a minimum of 37 STS-1s (38 STS-1s may be required for other vendor equipment) or 12 STS-3c (13 STS-3c may be required for other vendor equipment) cross-connections.

The 2G rate only applies to ports 1 and 3. If 2G is selected for port 1(or 3), then port 2(or 4) cannot be used for service. For example, if 2G is selected for port 1 then port 2 is unused, and ports 3 and 4 could be 1G for either of the port gfptypes (FC, FICON, or ASYNC-FC).

- **FICON** (Fibre Connection) - Supports full-rate 1Gbs (**1G**) or 2Gbs (**2G**) service using STS-1 or STS-3c cross-connections. The ports will not carry any traffic end-to-end unless the full rate is provisioned.
  - **Line Rate**: **1G** - Full-rate 1G service requires a minimum of 19 STS-1s or 6 STS-3c (7 STS-3c may be required for other vendor equipment) cross-connections.
  - **Line Rate**: **2G** - Full-rate 2G service requires a minimum of 37 STS-1s (38 STS-1s may be required for other vendor equipment) or 12 STS-3c (13 STS-3c may be required for other vendor equipment) cross-connections.

    The 2G rate only applies to ports 1 and 3. If 2G is selected for port 1(or 3), then port 2(or 4) cannot be used for service. For example, if 2G is selected for port 3 then port 4 is unused, and ports 1 and 2 could be 1G for either of the port gfptypes (FC, FICON, or ASYNC-FC).
- **ASYNC-FC** (Asynchronous Fibre Channel) - Supports full-rate or partial-rate 1Gbs (**1G**) or 2Gbs (**2G**) service using STS-1, STS-3c, or STS-12c cross-connections. Service starts as soon as any end-to-end paths are established in both directions.
  - **Line Rate**: **1G** - Full-rate 1G service requires a minimum of 19 STS-1s or 6 STS-3c (7 STS-3c may be required for other vendor equipment) cross-connections. If STS-12c is used, then only one STS-12c cross-connection is allowed.

    If the compression feature of the LNW73C is used, it typically would take only 9 STS-1s to transport the equivalent of 1Gbs full rate service. The actual compression saving depends on the data transported.
  - **Line Rate**: **2G** - Full-rate 2G service requires a minimum of 37 STS-1s (38 STS-1s may be required for other vendor equipment) or 12 STS-3c (13 STS-3c may be required for other vendor equipment) cross-connections. If STS-12c is used, then only one STS-12c cross-connection is allowed.

    The 2G rate only applies to ports 1 and 3. If 2G is selected for port 1(or 3), then port 2(or 4) cannot be used for service. For example, if 2G is selected for port 1 then port 2 is unused, and ports 3 and 4 could be 1G for either of the port gfptypes (FC, FICON, or ASYNC-FC).

    If the compression feature of the LNW73C is used, it typically would take only 18 STS-1s to transport the equivalent of 2Gbs full rate service. The actual compression saving depends on the data transported.

Cross-connections

Add/drop or pass-through cross-connections are established between the source and destination in a ring. Figure 11-56, “2-Way Point-to-Point, Through cross-connection” (p. 11-295) illustrates a 2-way pass-through cross-connection from one side of the ring to the other.

Figure 11-56 2-Way Point-to-Point, Through cross-connection

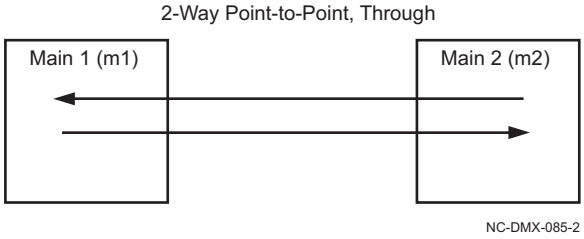


Figure 11-57, "UPSR Ring Add/Drop cross-connection" (p. 11-295) illustrates an add/drop cross-connection on a UPSR ring.

Figure 11-57 UPSR Ring Add/Drop cross-connection

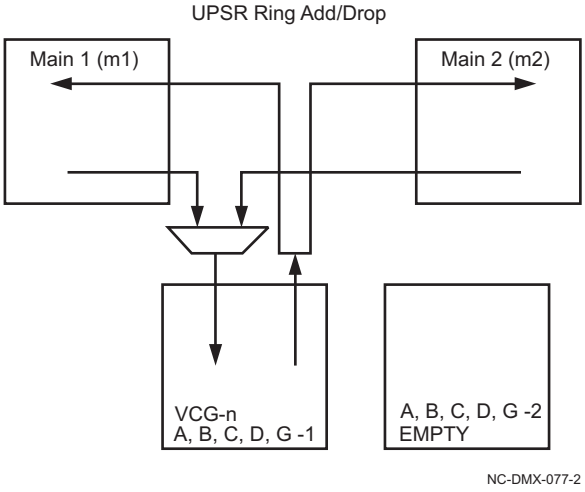


Figure 11-58, "2F BLSR Add/Drop cross-connection" (p. 11-296) illustrates an add/drop cross-connection on a BLSR ring.

Figure 11-58 2F BLSR Add/Drop cross-connection

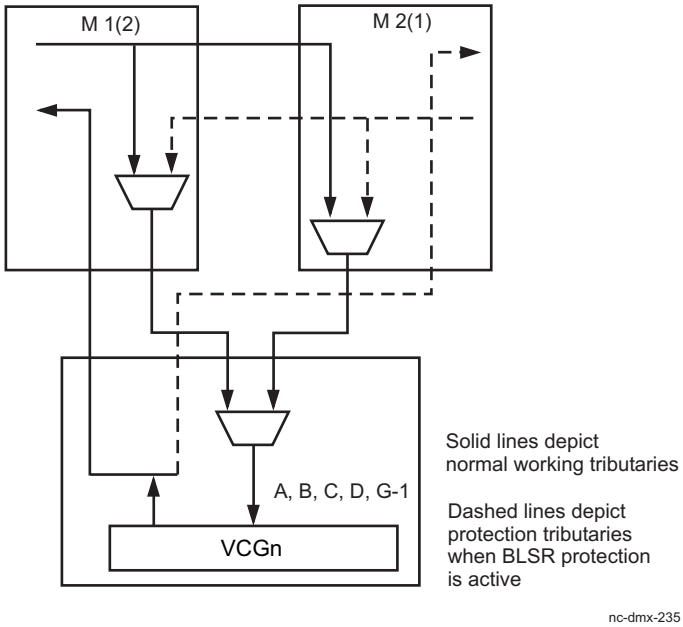
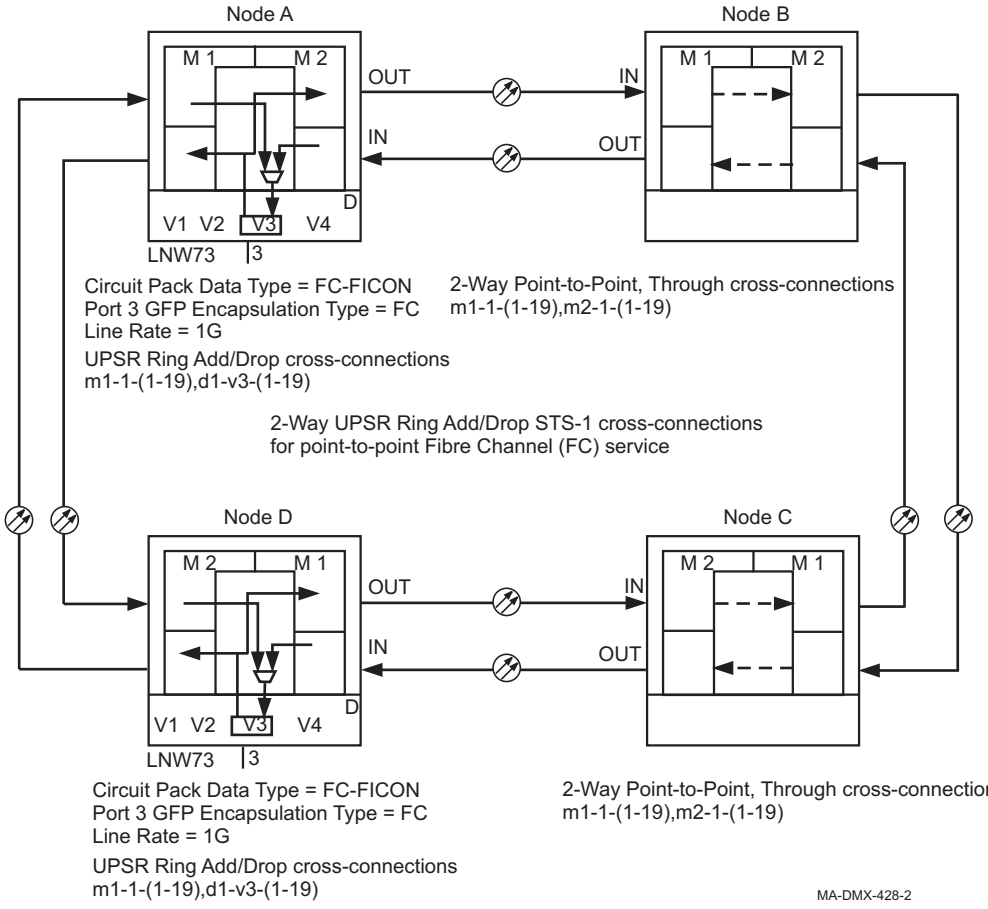


Figure 11-59 Point-to-point Fibre Channel service



Procedure 11-40: Establish video multi-channel broadcast network on UPSR/BLSR (NOTAG mode)

Overview

This procedure provides an example for configuring a distributed video broadcast network on a UPSR/BLSR ring using NOTAG tagging mode on the Ethernet circuit packs. See examples in Figure 11-60, "Provisioning cross-connections for video broadcast on UPSR ring" (p. 11-306) and Figure 11-61, "Provisioning cross-connections for video broadcast on BLSR ring" (p. 11-307).

Frames sent from the head end source node must be Multicast frames.

This procedure uses *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters.

This procedure assumes that the UPSR/BLSR SONET ring network configuration has already been established and no alarms are present.

Important! On connected Gigabit Ethernet devices with autonegotiation turned on/enabled, if transmission is interrupted in one direction of transmission on a Gigabit Ethernet device, then transmission will also be disabled in the other direction. For example, if one fiber in a transmit/receive pair is cut, then one-way transmission on the other fiber can be maintained only if autonegotiate is turned off/disabled and the link state is forced good at the transmit source equipment.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The shelf slots, circuit packs, ports, and VCGs being provisioned.
- The number and type of cross-connections to be made at each node.

  Important! This procedure is typically performed at full rate Gigabit service; full rate Gigabit service requires 21 STS-1 or equivalent cross-connections. Ensure that you have a sufficient number of STS-1s available.

  Ethernet circuit packs available for use with the NOTAG mode include the LNW63/64, LNW67/68, LNW70/LNW170, LNW71, LNW87 and LNW74. This procedure illustrates applications of a multi-channel broadcast network using 1 GbE rate (21 STS1s or equivalent) which requires the use of the LNW63/64, LNW67/68,

LNW87 or LNW70/LNW170 circuit packs. Applications using lower bandwidth may be provisioned similarly using the LNW71 or LNW74 circuit packs which support 2 to 3 STS1s. All circuit packs involved in the network must support the same cross-connection types and rate being used.

Steps

Use this procedure as an example for configuring a multi-channel video broadcast network.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** and/or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the terminating nodes, circuit packs, LAN ports, WAN (VCG) ports, and cross-connections associated with the service being established.

5 Verify that the Ethernet circuit packs have been installed into the required slot of the Function Unit or Growth group (A, B, C, D, or G) at each NE providing Ethernet service.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 

NOTICE

Service-disruption hazard

If the Ethernet circuit pack is already providing service, changing tagging mode will take down any existing service. The existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

CONFIGURE TAGGING MODE

At each NE providing this Ethernet service, determine the existing tagging mode for the Ethernet circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW67/68/70 circuit packs must be set to **`NOTAG`**. The VLAN Tagging Mode for the LNW63/64/71/74/87 circuit packs is **`NOTAG`** only and does not require setting.

> **Important!** When GbE circuit packs are installed in the shelf, the default "NOTAG" mode is assigned to the circuit pack.

7

If...	Then...
the tagging mode and all parameters are set correctly,	Proceed to Step 13.
the tagging mode is set correctly but other parameters are not correct,	Proceed to Step 10.
the tagging mode is NOT set correctly,	Continue with Step 8.

8 If you are going to change the VLAN Tagging Mode that presently exists AND cross-connections already exist, you must remove service and delete the existing cross-connections before changing the tagging mode.

Determine if cross-connections exist for the circuit packs being used. Use the TL1 **`rtrv-crs`** command or select the **View** → **Cross-Connections** command from the System View menu, select the circuit pack being provisioned, then click **Select**. Note if cross-connections exist.

9



NOTICE

Service-disruption hazard

Once cross-connections and a virtual switch is created and service has been established on the circuit pack, you cannot delete the cross-connections/virtual switch without interrupting service.

If required, remove existing service, then use the TL1 **`dlt-crs`** command or select the **Configuration** → **Cross-Connections** command from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard to delete all cross-connections on the circuit pack.

10 Provision circuit pack parameters. Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

11 Verify/Select the tagging mode (**`NOTAG`**) in the VLAN Tagging Mode box.

12 Verify/Enter other parameter values (for example, **Burst Size**, **Credit Interval** [LNW67/68], **Ethernet Cross Connect Mode** and **Port Configuration** [LNW70/LNW170]), as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: “Provision Ethernet circuit pack parameters” (p. 11-103)

END OF STEPS TO PROVISION CIRCUIT PACKS

13 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at the head end node, each Ethernet terminating node, and any pass through cross-connections to be made at any *non* terminating nodes in the network. See Figure 11-60, “Provisioning cross-connections for video broadcast on UPSR ring” (p. 11-306) and Figure 11-61, “Provisioning cross-connections for video broadcast on BLSR ring” (p. 11-307) for examples.

14 One at a time at each node in the network, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Select **Create a new Cross-Connections**, then click **Next** at the bottom of the screen.

Reference: Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204).

15 Use the Cross-Connection Wizard at each *non* terminating node to provision the **2-Way Point-to-Point, Through** cross-connections for a UPSR ring or **1-Way Point-to-Point, Through** cross-connections for a BLSR ring.

16 Use the Cross-Connection Wizard at the head end source node to provision the Ethernet one-way (**1-Way Point-to-Point**) cross-connections.

17 Use the Cross-Connection Wizard at the remote terminating nodes to provision the **1-Way Path Protected Drop from a UPSR Ring** cross-connections from a UPSR ring, or **1-Way Point-to-Point** cross-connections from a BLSR ring, and **2-Way Point-to-Point, Through** cross-connections for a UPSR ring or **1-Way Point-to-Point, Through** cross-connections for a BLSR ring.

18 From the System View menu, select **View** → **Cross-Connections** to verify that the proper cross-connections have been made.

19 **Important!** For LNW63/64/70/74/87 circuit packs, each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in the Input or Ouput Direction, as required.

If required, use the TL1 **`ed-vcgtrib`** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **`Enabled`** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

20 After all cross-connections are made at each node in the ring, click on the **Alarm List** button on the System View window and verify no new alarms are present.

21 If alarms are present, look for missing or improperly made cross-connections.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

22 *VERIFY PORT MONITORING MODE*

After all cross-connections have been made at each node in the ring, verify that the WAN (VCG) Ports being used have gone in service (IS) at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Important! Note that the VCG port at the head end source node will not show in-service since it is not provisioned to receive packets.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

23 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

24 Click on the **Fault/Alarms** tab. Verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, click **Close** to exit then proceed to Step 25.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),

Perform the following:

1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
2. In the parameters display area, click the **Fault/Alarms** tab, select **AUTO** for the **VCG Monitoring Mode**.
3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
4. Click **Close** to exit the window, then repeat this procedure from Step 22.

- If the VCG Monitoring Mode is **AUTO**:

  Verify that the VCG Trib Membership provisioning is correct. Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far end or near end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Select**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far end and near end circuit packs.

  Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

25 PROVISION LAN PORTS

Use the TL1 **`ed-eport`** command to provision the LAN port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN Port (for example, Port 1), then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

26 PROVISION VCGS

Use the **ed-vcg** TL1 command to provision the WAN (VCG) port parameters, or select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the VCG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

END OF STEPS

Figure 11-60 Provisioning cross-connections for video broadcast on UPSR ring

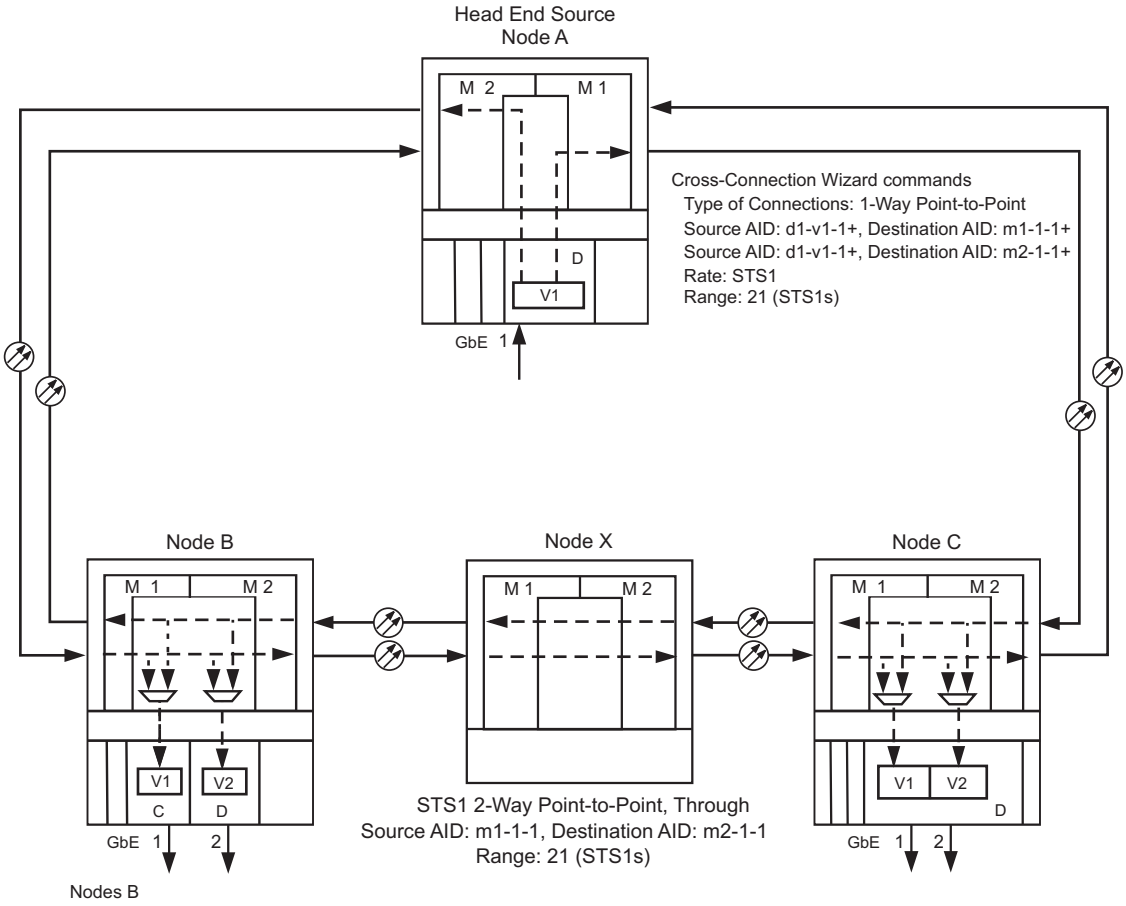
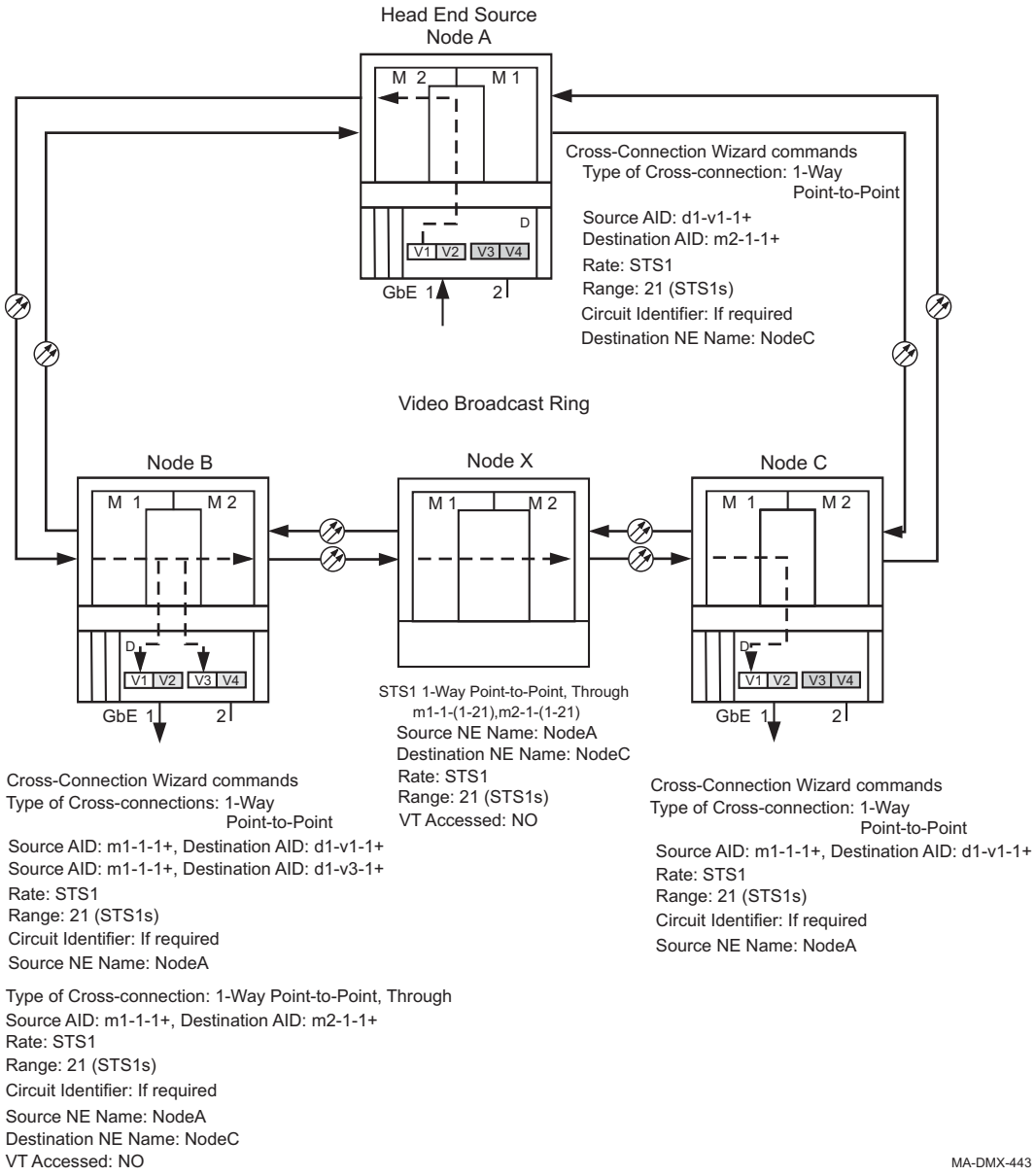


Figure 11-61 Provisioning cross-connections for video broadcast on BLSR ring



Procedure 11-41: Provision Resilient Packet Ring (RPR)-capable VCG parameters

Overview

This procedure provides a list of provisionable parameters for a Resilient Packet Ring (RPR)-capable VCG port.

RPR Span VCGs may be either VCG v1 or VCG v2. The RPR IF VCG is VCG v1.

The **ed-vcg-rpr** TL1 command is used to modify (edit) the RPR-capable properties of a port. An RPR instance consists of an Interface (IF) containing the common part (IF), and two directional Spans.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisioning parameters for a Resilient Packet Ring (RPR)-capable VCG port.

1 Use the **ed-vcg-rpr** TL1 command or select **Configuration** → **Equipment** from the System View menu. Expand the details of the LNW78 100/1G-FSR circuit pack, select the VCG being provisioned, then click **Select**.

2 Use Table 11-13, "ED-VCG-RPR command provisionable parameters" (p. 11-309) as reference to provision the necessary parameters from your work instructions.

All parameters are for the RPR IF (VCG v1) unless indicated as an RPR span (VCG v1 or VCG v2) parameter.

END OF STEPS

ED-VCG-RPR command parameters

Table 11-13, "ED-VCG-RPR command provisionable parameters" (p. 11-309) lists the provisionable parameters for a Resilient Packet Ring (RPR)-capable VCG port:

Table 11-13 ED-VCG-RPR command provisionable parameters

Parameter	Description
mtu_size	**MTU size (bytes)**. This parameter specifies the MTU (Maximum Transmission Unit) size supported on the port, addressed by the aid. This is the size of the payload in the Ethernet frame, excluding Source and Destination Address, Type and CRC field, but including all VLAN tags. Value: An integer in the range 46 to 10222. The initial value is 1508.
vmode	**VCG Monitoring Mode**. May have one of the following values: • AUTO - port automatically goes in-service (IS) when a valid input is received. • NMON (not monitored) This is an RPR Span parameter.
tagfilter	**Tag Filter**. This parameter is used to enable/disable VLAN/Port Tag filtering and may be one of the following: • ENABLE (initial value): allows only provisioned VLANs/port tags on a port. • DISABLE: allows all VLANs/port tags on a port. Tag Filter does not prevent creating, modifying, or deleting VLANs.
lcasmd	**LCAS Mode**. This parameter controls whether LCAS (Link Capacity Adjustment Scheme) is enabled for the specified VCG. When enabled, the LCAS protocol allows for hitless changes to the provisioned size of the VCG. This is a Span parameter.. Valid values are: • ENABLE (Initial Value) • DISABLE
htmr	**Hold-Off Timer (in milliseconds)**. This parameter, only in effect if lcasmd = ENABLE, specifies the delay between when a tributary is detected faulty and when it is automatically removed from the VCG. It allows underlying protection, if any, to react first. It applies to all tributaries in the specified VCG. This is a Span parameter. Values: • 0 to 10,000 ms (10 sec), in 100 millisecond steps. • 99,999 ms (represents infinity). Initial and only valid value for the LNW78.

Table 11-13 ED-VCG-RPR command provisionable parameters (continued)

Parameter	Description
vcat	**Virtual Concatenation Mode**. Specifies whether vcat overhead information is inserted/monitored for the specified VCG. It has effect only when a single trib is cross-connected to the VCG, to allow interworking with non-VCAT equipment. Valid values are: • ENABLE (default) • DISABLE vcat cannot be set to DISABLE if more than one tributary cross-connection exists on the VCG. This is an RPR Span parameter.
ifmode	**RPR IF Monitoring Mode**. May have one of the following values: • AUTO - port automatically goes in-service (IS) when a valid input is received on at least one associated span. • NMON - not monitored
addporttag	**Add Port Tag**. Composite list of Port Tag values to be added. Up to 55 Port Tag values can be provisioned in a single command. Values: An ampersand-separated list of Port Tag identifiers, where each Port Tag identifier is an integer in the range 1 to 4093. The initial status of this list is empty. Either the **addporttag** or **delporttag** parameters can be provisioned by this command, but not both. They must be provisioned in separate command instances. This parameter is valid when **vlantagmd** is set to SWITCHED (see ED-EQPT) and the port belongs to a virtual switch with **tagmd** set to TRANS). To be able to delete a port tag, MAC+tag address provisioning must be removed first from the port.

Table 11-13 ED-VCG-RPR command provisionable parameters (continued)

Parameter	Description
delporttag	**Delete Port Tag**. Composite list of Port Tag values to be deleted. Up to 55 Port Tag values can be provisioned in a single command. Values: An ampersand-separated list of Port Tag identifiers, where each Port Tag identifier is an integer in the range 1 to 4093. The initial status of this list is empty. Either the **addporttag** or **delporttag** parameters can be provisioned by this command, but not both. They must be provisioned in separate command instances. This parameter is valid when **vlantagmd** is set to SWITCHED (see ED-EQPT) and the port belongs to a virtual switch with **tagmd** set to TRANS). To be able to delete a port tag, MAC+tag address provisioning must be removed first from the port.
vpm	**VCG Performance Monitoring (PM)**. This parameter controls whether performance monitoring is enabled for the specified VCG. It controls the IF and both spans. Values: Values: • ENABLE (initial value) • DISABLE
ethertype	**Ethernet Type field (TPID)**. Used to interwork with other vendors' equipment using stacked VLAN. This parameter is valid only when **vlantagmd** is set to SWITCHED and the port belongs to a virtual switch with **tagmd** set to TRANS. Value: A hexadecimal string in the range 0601 to FFFF. The initial value is FFFF (hexadecimal).
qsz	**Total queue size**. This parameter applies VCGs on the LNW78. If the vcg is part of a virtual switch and the VLAN Tagging Mode (vlantagmd) is set to SWITCHED, valid value is an integer between 0 and 256 Kbytes (default is 256 Kbytes). The value cannot be greater than the maximum supported frame size. Refer to the MTU Size parameter.
qminthldy	**Yellow Packet Minimum (Min) Drop Threshold**. Specifies the minimum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 99 (default is 33). Value must be less than the Yellow Max Drop Threshold. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW78.

Table 11-13 ED-VCG-RPR command provisionable parameters (continued)

Parameter	Description
qmaxthldy	**Yellow Maximum (Max) Drop Threshold**. Specifies the maximum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 100 (default is 50). Value must be greater than the Yellow Min Drop Threshold and less than or equal to the Green Min Drop Threshold This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW78.
qminthldg	**Green Minimum (Min) Drop Threshold**. Specifies the minimum dropping threshold for yellow packets used by the drop algorithm. Expressed as a "percentage" of the total queue size (qsz). Valid value is an integer from 0 through 100 (default is 90). Value must be greater than or equal to the Yellow Max Drop Threshold. This parameter applies only if the port is part of a virtual switch when the circuit pack VLAN Tagging Mode (vlantagmd) is set to SWITCHED. Parameter only applies to the LNW78.
qdropwt1	**Maximum drop probability mark for CoS 1 (Class C) packets**. This parameter is used by the drop algorithm. It is expressed as a percentage. Value: an integer between 0 and 100. The initial value is 100. **qdropwt1** must be ≥ **qdropwt2** >= **qdropwt3**.
qdropwt2	**Maximum drop probability mark for CoS 2 (Class B) packets**. This parameter is used by the drop algorithm. It is expressed as a percentage. Value: an integer between 0 and 100. The initial value is 100. **qdropwt1** must be ≥ **qdropwt2** ≥ **qdropwt3**.
qdropwt3	**Maximum drop probability mark for CoS 3 (Class A) packets**. This parameter is used by the drop algorithm. It is expressed as a percentage. Value: an integer between 0 and 100. The initial value is 50. **qdropwt1** must be >= **qdropwt2** >= **qdropwt3**.

Procedure 11-42: Provision Resilient Packet Ring (RPR)-specific VCG parameters

Overview

This procedure provides a list of provisionable Resilient Packet Ring (RPR)-specific parameters for a VCG port.

RPR Span VCGs may be either VCG v1 or VCG v2. The RPR IF VCG is VCG v1.

The **ed-rpr** TL1 command is used to modify (edit) the RPR-specific properties of a port. An RPR instance consists of an Interface (IF) containing the common part (IF), and two directional Spans.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the terminating Ethernet nodes.
- The values to be set for each parameter.

Steps

Use this procedure as a reference for provisioning Resilient Packet Ring (RPR)-specific parameters for a VCG port.

1 Use the **ed-rpr** TL1 command or select **Configuration** → **Equipment** from the System View menu. Expand the details of the LNW78 100/1G-FSR circuit pack, select the VCG being provisioned, then click **Select**.

2 Use Table 11-14, "ED-RPR command provisionable parameters" (p. 11-314) as reference to provision the necessary parameters from your work instructions.

All parameters are for the RPR IF (VCG v1) unless indicated as an RPR span (VCG v1 or VCG v2) parameter.

END OF STEPS

ED-RPR command parameters

Table 11-14, "ED-RPR command provisionable parameters" (p. 11-314) lists the Resilient Packet Ring (RPR) provisionable parameters for a port:

Table 11-14 ED-RPR command provisionable parameters

Parameter	Description
enh_brdgmd	**Enhanced Bridging Mode.** Values are: • ENABLE (initial value). When enabled, the RPR bridge learns RPR node addresses to obtain spatial reuse. • DISABLE. When disabled, 802.17 "basic" bridging is used.
ptqsize	**Primary Transit Queue Size (bytes)**. Value: an integer in the range 2000 to 51200, in number of bytes. Initial value is 5000.
stqsize	**Secondary Transit Queue Size (bytes)**. Value: an integer in the range 2000 to 4194304, in number of bytes. Initial value is 1800000.
stqfullthr	**Secondary Transit Queue Full Threshold (bytes)**. The STQ occupancy above which secondary transit traffic has priority over any add traffic. Value: an integer in the range 2000 - 4194304, in number of bytes. Initial value is 1795000.
prot_wtr	**RPR Protection Wait-to-Restore (sec)**. After a fault clears, the protected state is maintained for the duration of this timer. Value: an integer in the range of 0 to 1440 representing seconds. The initial value is 0.
prot_fasttmr	**RPR Protection Fast Timer (msec)**. The interval between fast Topology and Protection messages. Value: an integer in the range of 1 to 20 representing milliseconds. The initial value is 10.
prot_slowtmr	**RPR Protection Slow Timer (50 msec unit)**. The interval between slow Topology and Protection messages. Value: an integer in the range of 1 to 200 representing 50 milliseconds. The initial value is 20, which equals to 1 second.
prot_hotmr	**RPR Protection Holdoff Timer**. The delay after an external defect occurs, to allow a lower layer to protect, before RPR protection is invoked. To hold off for defects severe enough to cause keep-alive timeout, prot_katmr should be set to the same value or higher. Value: an integer in the range 0 - 250, representing milliseconds. Initial value is 0.

Table 11-14 ED-RPR command provisionable parameters (continued)

Parameter	Description
prot_katmr	**RPR Protection Keep Alive Timer (msec)**. The timer after which a span is declared failed if no Single-Choke Fairness message is received. Value: an integer in the range of 2 to 250 representing milliseconds. The initial value is 3.
fair_maxrate	**Fairness Maximum Add Rate**. The maximum rate that fairness-eligible (best-effort) traffic can be added to each ringlet. This is an RPR Span parameter. Value: an integer in the range 0 - 1200, in units of Mb/s. Values over the line rate are interpreted as line rate. Initial value is 1200.
atd_tmr	**Attribute Discovery (ATD) Timer (50 msec unit)**. The period between ATD messages. Value: an integer in the range of 1 to 200 representing 50 milliseconds units. The initial value is 20, which equals to 1 second.
tstab_tmr	**Topology Stability Timer (msec)**. The period for determining topology stabilization. Value: an integer in the range of 10 to 100 representing milliseconds. The initial value is 40.
fair_ramp	**Fairness Ramp Coefficient**. The coefficient for ramping up an allowed rate. Value: an integer in the range of 4 to 9 representing the logarithm of the actual coefficient. The initial value is 6.
fair_lp	**Fairness Low Pass Coefficient**. The relative weight of the low-pass filter rate counters in successive aging intervals. Value: an integer in the range of 4 to 11 representing the logarithm of the actual coefficient. The initial value is 6.
fair_advert	**Fairness Advertisement Ratio (units of 0.00025)**. The ratio between bandwidth for fairness control messages and total link capacity. Value: an integer in the range of 1 to 40 in units of 0.00025. The initial value is 5.
fair_stqhi	**Fairness STQ High Threshold**. Maximum STQ occupancy above which fairness-elegible add frames are no longer admitted to the ring. Value: an integer in the range of 0 to 1000 representing tenths of percent of **stqfullthr**. The initial value is 250.

Table 11-14 ED-RPR command provisionable parameters (continued)

Parameter	Description
fair_stqlo	**Fairness STQ Low Threshold**. STQ occupancy above which congestion of the outbound link is imminent. Value: an integer in the range of 0 to 1000 representing tenths of percent of **fair_stqhi**. The initial value is 500.
fair_agec	**Fairness Aging Coefficient**. Controls the amount of history kept in a rate estimator. Value: an integer in the range of 0 to 4 representing the logarithm of the actual coefficient. The initial value is 2.
rsv_a	**Reserved Class A Add Rate (Mb/sec)**. The maximum rate at which Class A traffic is allowed to be added to each ringlet. It controls the Class A shaper. This is an RPR Span parameter. Value: an integer in the range of 0 to 1200 in units of Mb/s. The initial value is 0.
rsv_b	**Reserved Class B Add Rate (Mb/sec)**. The maximum rate at which Class B traffic is allowed to be added to each ringlet. It controls the Class B shaper. This is an RPR Span parameter. Value: an integer in the range of 0 to 1200 in units of Mb/s. The initial value is 0.

Procedure 11-43: Bridge and roll Ethernet cross-connections

Overview



NOTICE

Service-disruption hazard

Service interruption of up to 25 ms for STS or VT cross-connections may occur when an existing source is rolled to a new source. In cases involving roll procedures from Main 2 cross-connections to function slot ports, the service interruption may be as high as 200 ms.

Use this procedure to move traffic to another circuit path. Traffic can be moved from the existing tributary to another tributary on:

- the same set of interconnecting facilities.
- a different set of interconnecting facilities.

Traffic is moved using a coordinated sequence of bridging and rolling cross-connection legs at the terminating (add/drop) nodes and provisioning new cross-connections at pass-through nodes (UPSRs/BLSRs only).

At the head-end terminating node of a 1-way circuit, the existing add cross-connection leg is bridged to the new destination tributary allowing traffic to be added to the new circuit path.

At the tail-end terminating node of the 1-way circuit, the existing drop cross-connection leg is rolled to the new source tributary allowing traffic to be switched to the new circuit path.

For 2-way circuits, traffic in one direction of transmission is moved to the new circuit path, then the traffic in the opposite direction of transmission is moved to the new circuit path.

Bridging cross-connection legs

Cross-connection legs are bridged at the head-end terminating node of a 1-way circuit to move traffic to the new circuit path. Bridged cross-connection legs allow a single source tributary to be cross-connected to multiple destination tributaries at the same rate.

At the head-end terminating node of a 1-way circuit, the existing add cross-connection leg is bridged using *1-Way Point-to-Point* or *1-Way Path Protected Drop from a UPSR Ring* cross-connections.

Rolling cross-connection legs

Cross-connection legs are rolled at the tail-end terminating node of a 1-way circuit to switch traffic from the existing circuit path to the new circuit path. The source tributary of the existing drop cross-connection is switched to the new source tributary at the same rate.

Guidelines for provisioning the circuit ID parameter

When bridging/rolling cross-connection legs use the following guidelines to provision the circuit ID parameter.

- If an existing cross-connection has (or does not have) a circuitid value, and you want the new circuit to have a different or new circuitid value (circuitid=some_other_value), then specify circuitid=some_other_value in the bridge command. Then, specify the same circuitid=some_other_value in the roll command.
- If an existing cross-connection does *not* have a circuitid value, and you do *not* want the new circuit to have a circuitid value, then do *not* specify a circuitid value in the bridge command. Then, do *not* specify a circuitid value in the roll command.
- If an existing cross-connection has a circuitid value and you want the new circuit to have the same circuitid value, then specify the *same* circuitid value in the bridged cross-connection. Then, do *not* specify a circuitid value in the roll command.
- If an existing cross-connection has a circuitid value and you do *not* want the new circuit to have a circuitid value, then do not specify a circuitid value in the bridge command. Then, specify a null value for the circuitid (circuitid="") in the roll command.

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Before you begin this procedure, you must:

1. Refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions specify the existing circuit path including terminating (add/drop) nodes, pass-through nodes (UPSRs/BLSRs only), cross-connections, and port/tributary addresses.
5. Verify that the work instructions specify the new circuit path including port/tributary addresses, cross-connections, and pass-through nodes (UPSRs/BLSRs only).

Steps

Complete the following steps to move traffic to another circuit path.

1 **Important!** For 2-way circuits, traffic in one direction of transmission is moved to the new circuit path, then the traffic in the opposite direction of transmission is moved to the new circuit path.

Using the work instructions, determine whether the circuit to be moved is 1-way or 2-way. If the circuit to be moved is 2-way, identify the direction of transmission to be moved first.

2 Identify and log in to the terminating (add/drop) nodes.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Identify and record the existing interconnecting facilities and the new interconnecting facilities (if required). If required, at the terminating (add/drop) nodes select **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the interconnecting facilities is not provided with the work instructions, it is recommended that you draw a simple diagram and list each node's TID.

4 **Important!** If the Port Monitoring Mode parameter is *AUTO*, the port automatically transitions to the *in service* state if a valid signal is detected and the port is monitored/alarmed. If the Port Monitoring Mode is *NMON*, the port is not monitored/alarmed, and the port will not automatically transition to the *in service* state if a valid signal is detected. No alarm reporting creates the possibility of service degradation or service outage if the new circuit path has a defect. If the **Port Monitoring Mode** is provisioned *IS*, the port is always monitored/alarmed.

At each terminating (add/drop) and pass-through node (UPSRs/BLSRs only), select **View** → **Equipment** and verify that all circuit packs, pluggable transmission modules, ports, and protection groups have been provisioned at each node.

If required, refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional installation and provisioning.

5 **Important!** Before moving traffic to the new circuit path, new cross-connections must be created at pass-through nodes (UPSRs/BLSRs only).

If moving a...	Then at each pass-through node (UPSRs/BLSRs only)...
1-way circuit,	select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and create the required new **1-Way Point-to-Point, Through** cross-connection.
2-way circuit,	select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and create the required new **2-Way Point-to-Point, Through** cross-connection.

6 At each pass-through node (UPSRs/BLSRs only), select **View** → **Cross-Connections** to access the cross-connection list and verify that the required pass-through cross-connection was created.

7 **Important!** If the Tributary Monitoring Mode parameter is *AUTO*, the tributary automatically transitions to the *in service* state if a valid signal is detected and the tributary is monitored/alarmed. If the Tributary Monitoring Mode is *NMON*, the tributary is not monitored/alarmed, and the tributary will not automatically transition to the *in service* state if a valid signal is detected.

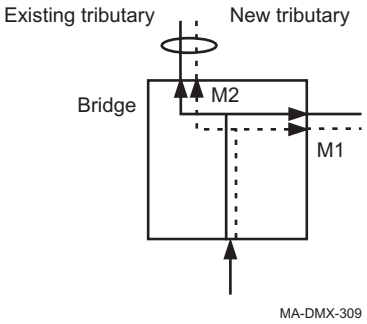
At each pass-through node (UPSRs/BLSRs only), select **View** → **Equipment** and verify the new Tributary parameters.

If required, use **Configuration** → **Equipment** and refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional provisioning.

8 **Important!** At the head-end terminating node of the 1-way circuit, the traffic to be moved must be bridged to the new tributary. In UPSRs, the traffic to be moved must be bridged to the same new tributary on Main/Function/Growth 1 and Main/Function/Growth 2.

At the head-end node of the 1-way circuit, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard*. Select **Bridge a cross-connection from a source to multiple destinations** and follow the directions to bridge the add cross-connection leg to the required new destination tributary(ies).

The following figure shows an example of an add cross-connection leg bridged to new destination tributaries within a UPSR.



9 At the head-end node of the 1-way circuit, select **View** → **Cross-Connections** to access the cross-connection list and verify that the required add cross-connection leg was bridged to the new destination tributary(ies).

10 **Important!** If the Tributary Monitoring Mode parameter is *AUTO*, the tributary automatically transitions to the *in service* state if a valid signal is detected and the tributary is monitored/alarmed. If the Tributary Monitoring Mode is *NMON*, the tributary is not monitored/alarmed, and the tributary will not automatically transition to the *in service* state if a valid signal is detected.

At the head-end node of the 1-way circuit, select **View** → **Equipment** and verify the new Tributary parameters.

If required, use **Configuration** → **Equipment** and refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional provisioning.

11 At each terminating (add/drop) and pass-through node (UPSRs/BLSRs only), click the **Alarm List** button to obtain an *NE Alarm List* and verify that no alarms are present. Clear all alarms before continuing this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

12



NOTICE

Service-disruption hazard

Service interruption of up to 25 ms for STS or VT cross-connections may occur when performing the following roll procedures. In cases involving roll procedures from Main 2 cross-connections to Function slot ports, the service interruption may be as high as 200 ms.



NOTICE

Service-disruption hazard

Service outage will occur if all new cross-connections are not properly made before performing the following roll procedures.

Important! It is suggested that you use a Command Mode (cmdmde) of **NORM** when rolling a cross-connection input to a SONET interface. If the new input is being monitored and it is defective (for example: AIS-P, Loss of Pointer (LOP), STS UNEQ, B3 Signal Fail), the command will not complete. A Command Mode of **FRCD** allows the command to complete even if the new input is defective.

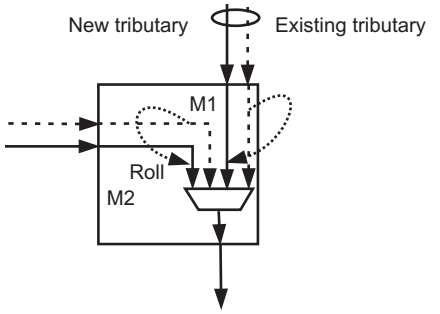
When rolling a cross-connection input to a non-SONET interface, the new input is not monitored and the Command Mode must be set to **FRCD**.

At the tail-end terminating node of the 1-way circuit, the traffic to be moved must be rolled to the new tributary. In UPSRs, the traffic to be moved must be bridged to the same new tributary on Main/Function/Growth 1 and Main/Function/Growth 2.

At the tail-end node of the 1-way circuit, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard*. Select **Roll a cross-connection from a source to a new source** and follow the directions to roll the drop cross-connection leg(s) to the required new source tributary(ies).

If a new Circuit Identifier (circuitid) is not specified, then the circuitid parameter value of the resultant cross-connection is inherited from the original cross-connection. If a new Circuit Identifier (circuitid) is null (circuitid=""), then the circuitid parameter value of the resultant cross-connection is cleared.

The following figure shows an example of drop cross-connection legs rolled to new source tributaries within a UPSR.



13 At the tail-end node of the 1-way circuit, select **View** → **Cross-Connections** to access the cross-connection list and verify that the required drop cross-connection leg(s) was rolled to the new source tributary(ies).

14 **Important!** If the Tributary Monitoring Mode parameter is *AUTO*, the tributary automatically transitions to the *in service* state if a valid signal is detected and the tributary is monitored/alarmed. If the Tributary Monitoring Mode is *NMON*, the tributary is not monitored/alarmed, and the tributary will not automatically transition to the *in service* state if a valid signal is detected.

At the tail-end node of the 1-way circuit, select **View** → **Equipment** and verify the new Tributary parameters.

If required, use **Configuration** → **Equipment** and refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures" to perform additional provisioning.

15 If moving a 2-way circuit, repeat Step 8 through Step 14 to move the traffic in the opposite direction of transmission to the new circuit path; otherwise, continue with the next step.

16 At each terminating (add) and pass-through node (UPSRs/BLSRs only), select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard*. Select **Delete leg(s) of an existing cross-connection** and follow the directions to delete the original cross-connections in the original circuit path.

END OF STEPS

Procedure 11-44: Establish Resilient Packet Ring (RPR)

Overview

This procedure provides an example for establishing a Resilient Packet Ring (RPR) on a unidirectional path switched ring (UPSR) or a bidirectional line switched ring (BLSR) with nonpreemptible unprotected traffic (NUT) access.

This procedure assumes that the UPSR/BLSR ring network configuration has already been established and no alarms are present.

This procedure uses TL1 commands and specific *WaveStar*® CIT menu selections to illustrate the detailed provisioning parameters. For examples, see Figure 11-62, "Resilient packet ring (RPR) on a UPSR" (p. 11-332), Figure 11-63, "Resilient packet ring (RPR) with multiple RPR circuit packs in same node" (p. 11-333), Figure 11-64, "Resilient packet ring (RPR) on a BLSR" (p. 11-334), Figure 11-65, "Resilient packet ring (RPR) on a main and subtending UPSR ring" (p. 11-335), and Figure 11-66, "Resilient packet ring (RPR) hub node intersection cross-connections" (p. 11-336)

Privilege level

You must login as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The network configuration and the nodes participating in the packet ring network.
- The shelf slots, circuit packs, ports, and VCGs involved in the packet ring network.
- The number and type of cross-connections to be made at each node.
- The tagging mode (Transparent or 802.1TAG), virtual switch ID, and RPR IF and Span parameters.

Steps

Use this procedure as an example to establish a Resilient Packet Ring (RPR) with Transparent VLAN Tagging Mode.

1 Use the *WaveStar*® CIT to log in to one of the terminating nodes, if not already performed.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 On the System View menu, select **Administration** → **OSI Routing Map** or **Administration** → **OSI Neighbor Map** to retrieve a node-to-node listing of every node in the network.

Important! If a drawing of the network is not provided with the work instructions, it is recommended that you draw a simple diagram of the ring (indicating node-to-node connections) and list each node's TID.

This command may take several minutes to complete depending on the size of the network.

Result: The *OSI Routing Map* or *OSI Neighbor Map* window opens.

3 Verify that the system configuration is the same as specified on your work instructions.

4 From your work instructions, determine the circuit pack, port, and cross-connections to be made at each node associated with the packet ring being established.

5 Verify that the LNW78 100/1G-FSR circuit packs have been installed into the required slot of the Function Unit or Growth groups (A, B, C, D, or G) at each NE providing service.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 Use the TL1 **`ed-eqpt`** command or select the **Configuration** → **Equipment** command from the System View menu, select the circuit pack being provisioned, then click **Select**.

7 Verify/Enter **Ethernet Cross Connect Mode**, as required, then click **Apply**. Read the warning message, then click **OK** to make your changes. Click **Close** to exit.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

8 ESTABLISH SONET CROSS-CONNECTIONS

Determine the necessary cross-connections to be made at each terminating node and any pass-through cross-connections to be made at any non terminating nodes in the network.

A maximum of 24 STS-1s may be assigned for each VCG. The LNW78 in STS1 Ethernet Cross Connect Mode supports STS1 cross-connections. In STS12c Ethernet Cross Connect Mode, only STS3c and STS12c cross-connections are supported.

For services using less than three STS-1s, it is recommended that the default values of the following **`ed-rpr`** command parameters be changed to the values listed:

- prot_katmr (RPR Protection Keep Alive Timer) = 5.
- fair_advert (Fairness Advertisement Ration) = 15.

Reference: Procedure 11-42: "Provision Resilient Packet Ring (RPR)-specific VCG parameters" (p. 11-313)

9 One at a time at each node in the network, use the TL1 **`ent-crs-sts1`** command to provision the cross-connections. Or, select **Configuration** → **Cross-Connections** from the System View menu to start the Cross-Connection Wizard. Use the Cross-Connection Wizard at each non terminating node to provision the **`2-Way Point-to-Point, Through`** pass-through cross-connections. Use the Cross-Connection Wizard at each terminating node to provision the appropriate Ethernet cross-connections. For example, see Figure 11-62, "Resilient packet ring (RPR) on a UPSR" (p. 11-332), Figure 11-63, "Resilient packet ring (RPR) with multiple RPR circuit packs in same node" (p. 11-333), Figure 11-64, "Resilient packet ring (RPR) on a BLSR" (p. 11-334), Figure 11-65, "Resilient packet ring (RPR) on a main and subtending UPSR ring" (p. 11-335), and Figure 11-66, "Resilient packet ring (RPR) hub node intersection cross-connections" (p. 11-336).

In nodes with RPR supported across multiple RPR circuit packs, cross-connections are made from VCG v1 on one pack to main-1 or fn/growth-1 tribs and VCG v2 on the other pack is connected to main-2 or fn/growth-2 tribs. VCG v2 on the first pack and VCG v1 on the second pack are connected through hairpin cross-connections as shown in Figure 11-63, "Resilient packet ring (RPR) with multiple RPR circuit packs in same node" (p. 11-333).

Networks consisting of main and subtending rings with RPR nodes at the hub UPSR node require special cross-connection considerations. This configuration is valid only with VLF main circuit packs at the hub UPSR node. For example, see Figure 11-65, "Resilient packet ring (RPR) on a main and subtending UPSR ring" (p. 11-335), and Figure 11-66, "Resilient packet ring (RPR) hub node intersection cross-connections" (p. 11-336).

Reference: Refer to Procedure 11-24: "Make cross-connections for Ethernet service" (p. 11-204) for other cross-connection examples.

10 From the System View menu, select **View** → **Cross-Connections** to verify that the proper connections have been made.

11 **Important!** Each tributary cross-connected to a VCG must be Enabled before it becomes an active member of the VCG. Select **View** → **Data** → **Ethernet/Data/VCG Port** to verify that VCG Membership has been Enabled in both Input and Output Direction.

If required, use the TL1 **ed-vcgtrib** command to enable tributaries, or from the System View menu at each node, select **Configuration** → **Equipment**. Expand the details for the circuit pack and VCGs being used. Highlight the tributary (Trib) being enabled then click **Select**.

Select **Enabled** for the **VCG Membership** in both the Input and Output Direction. Click **Apply**, read the warning message, then click **Yes** to execute the command. Repeat this step for each tributary being enabled. Click Close to exit.

When Input VCG Membership (source) (**inmbs**) is enabled, the VCG tributary is a member of the VCG in the source direction (towards the SONET network). When Output VCG Membership (sink) (**outmbs**) is enabled, the VCG tributary is a member of the VCG in the sink direction (away from the SONET network).

Reference: Procedure 11-33: "Provision LCAS, add/enable/remove tributaries" (p. 11-260)

12 **Important!** At least one tributary at each terminating end of the circuit must be Enabled in order for the VCG to go in service.

After all cross-connections have been made, verify that the WAN (VCG) Ports being used have gone in service at each terminating node. From the System View menu at each terminating node, select **View** → **Data** → **Ethernet/Data/VCG Port**.

Result: The *View LAN (Ethernet) WAN (VCG) Port* window opens.

13 Expand the details for the circuit pack being used. Select the required **VCG v( )** port, then click **Select** at the bottom of the window. Verify the VCG AID is correct at the top of the parameter display.

14 Click on the **VCG Data** tab. Under the **Fault/Alarms** section of the parameter display, verify the **VCG Monitoring Mode** is **IS** (in service). If the **VCG Monitoring Mode** is **IS**, proceed to Step 15.

- If the VCG Monitoring Mode is **NMON** (Not Monitored),
  1. Click **Close** to exit this window. From the System View menu, select **Configuration** → **Equipment**. Expand the details for the circuit pack being used, then select the required **VCG v( )** port and click **Select** at the bottom of the window.
  2. In the parameters display area, click the **VCG Data** tab. Under the **Fault** section, select **AUTO** for the **VCG Monitoring Mode**.
  3. Click **Apply** at the bottom of the window then click **Yes** in the warning message to execute the command.
  4. Click **Close** to exit the window, then repeat this procedure from Step 12.
- If the VCG Monitoring Mode is **AUTO**:

  Look for missing or improperly made cross-connections. Verify that the proper cross-connections were made to the correct VCG at each terminating node.

  If proper cross-connections have been made, then indications are that either the far-end or near-end circuit pack at each end of the span has failed or must be reset. *If the circuit pack already has service established on another pair of VCGs, the following will interrupt service.*

  – Log in to the NE at the far end of the span that connects to the near-end VCG not in service. Select the **Fault** → **Reset** → **Smart Pack** command from the System View menu, then select the circuit pack to be reset. Click **Apply**. Read the warning message, then click **Yes**. Wait until the alarms clear, then check the VCG Monitoring Mode again. If the VCG Monitoring Mode does not go in service (**IS**), then reset the near-end circuit pack and check the VCG Monitoring Mode.

  – If, after resetting the circuit packs, the VCG is still not in service, replace, one at a time, the far-end and near-end circuit packs.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

15



NOTICE

Service-disruption hazard

Once a virtual switch is created and service has been established on the circuit pack, you cannot delete the virtual switch without interrupting service.

If the service you are establishing in this procedure is a second service on an existing circuit pack with all LAN/WAN ports in the same virtual switch, then the existing virtual switch ID must be retained or the ports not in service must be removed from the existing virtual switch and added to a new virtual switch ID.

Create a virtual switch using the **`ent-vrtsw`** TL1 command or **Configuration** → **Data** → **Create Virtual Switch** command from the System View menu. Select the circuit pack and provision the following parameters:

- **Virtual Switch ID** (**`vrtswid`**) - Value in the range of 1-8 for the LNW78 circuit packs.
- **Virtual LAN Tagging Mode** (**`tagmd`**) - Value of **`802.1TAG`** or **`Transparent`**.
- **Ethernet (LAN) Ports** (**`eplst`**) - List or selection of LAN ports associated with the virtual switch ID.
- **VCG (WAN) Ports** (**`vcglst`**) - List or selection of VCG ports associated with the virtual switch ID.
  In this release, the only VCG allowed is the RPR IF VCG (v1).

16 Perform one of the following:

- If the **VLAN Tagging Mode** is set to **802.1TAG**:
  Use the TL1 **`ent-vlan`** command to assign the default VLAN ID for customer untagged frames or the customer VLAN ID for tagged frames to the associated Ethernet (LAN) Ports and VCG (WAN) Ports. Or, select **Configuration** → **Data** → **Create VLAN** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.
- If the **VLAN Tagging Mode** is set to **Transparent**:
  Use the TL1 **`ed-eport`** and **`ed-vcg`** commands to assign port tags to the associated Ethernet (LAN) Ports and VCG (WAN) Ports. Or, select **Configuration** → **Data** → **Create Port Tag** command from the CIT System View menu. Highlight the circuit pack being provisioned, then click **Select**. Provision the parameters as required. Click **Apply**, then click **Yes** to the warning message. Click **Close** to exit.

17 PROVISION LAN (Ethernet) PORTS

If not already performed, use the TL1 **ed-eport** command to provision parameters for the LAN port being provisioned. Or, select **Configuration** → **Equipment** from the System View menu, expand the details for the circuit pack, highlight the LAN port, then click **Select**. Provision the parameters as required.

Click **Apply**, then click **Yes** to execute the command. Click **Close** to exit.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

18 Provision RPR IF VCG and RPR Span VCG parameters, as required.

Use the **ed-rpr** and/or the **ed-vcg-rpr** TL1 commands or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, select the VCG being provisioned, then click **Select**. Provision the parameters as required.

VCG v1 is a RPR IF VCG and a RPR Span VCG. VCG v2 is a Span VCG.

The **ed-rpr** TL1 command is used to modify (edit) the RPR-specific properties of a port. An RPR instance consists of an Interface (IF) containing the common part (IF), and two directional Spans.

The **ed-vcg-rpr** TL1 command is used to modify (edit) the properties of an RPR-capable virtual concatenation group (VCG).

Reference: Procedure 11-41: "Provision Resilient Packet Ring (RPR)-capable VCG parameters" (p. 11-308)

Procedure 11-42: "Provision Resilient Packet Ring (RPR)-specific VCG parameters" (p. 11-313)

19 Verify the RPR ring is closed and no RPR related alarms are present. Use the **rtrv-map-rpr** TL1 command, or from the System View menu, select **View** → **Rings** → **Ring Map**, select the RPR Ring, then click **Select**. Verify that the **Topology Type Status** indicates **CLOSED** and the Number of Nodes is reported correctly. Click **Close** to exit.

Click the **Alarm List** button and verify no RPR alarms are present.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

20 Provision Ethernet Quality of Service (QoS) parameters, as required.

Reference: Procedure 11-45: “Provision Ethernet quality of service (QoS) - LNW78” (p. 11-337)

END OF STEPS

Figure 11-62 Resilient packet ring (RPR) on a UPSR

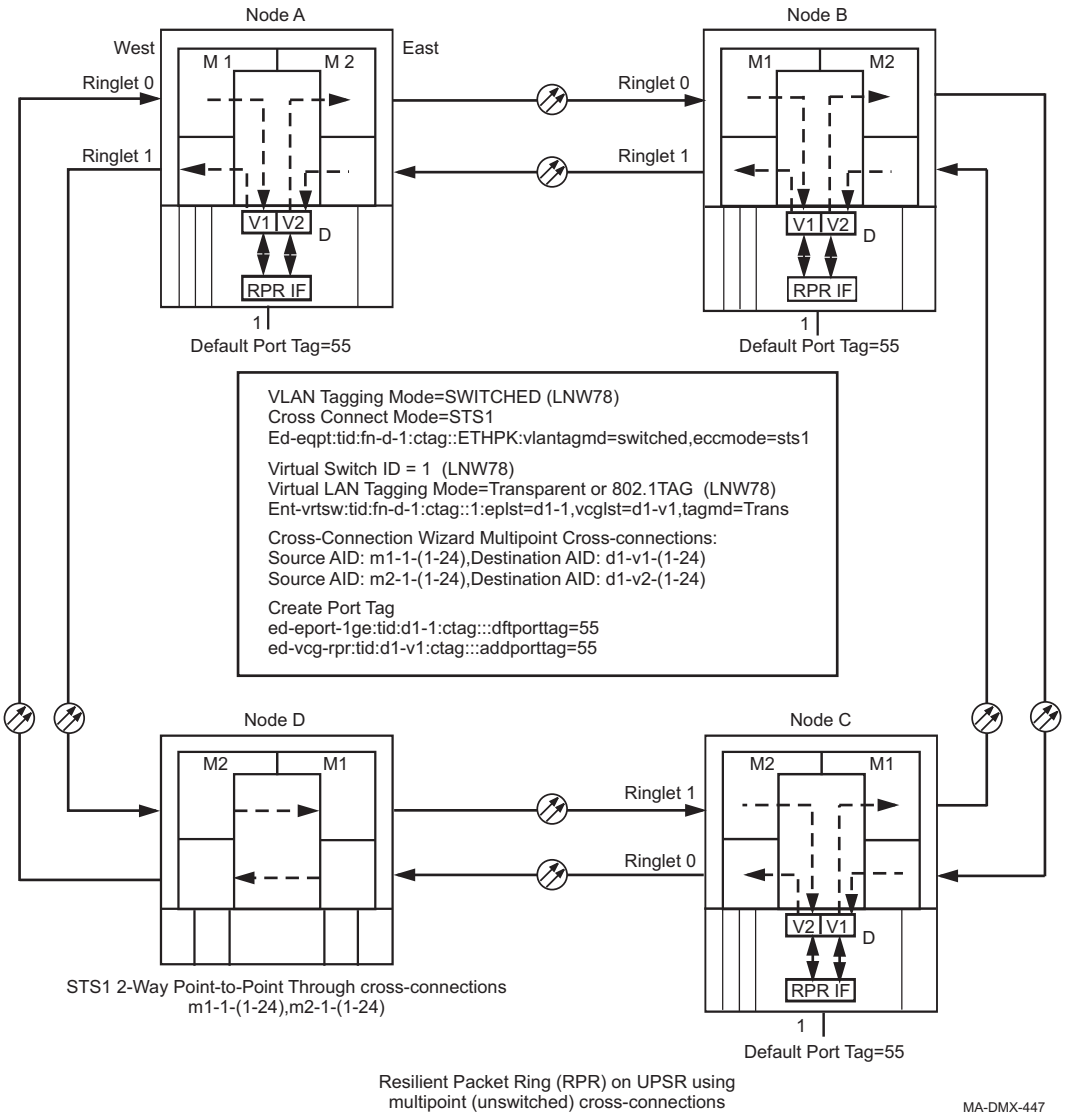


Figure 11-63 Resilient packet ring (RPR) with multiple RPR circuit packs in same node

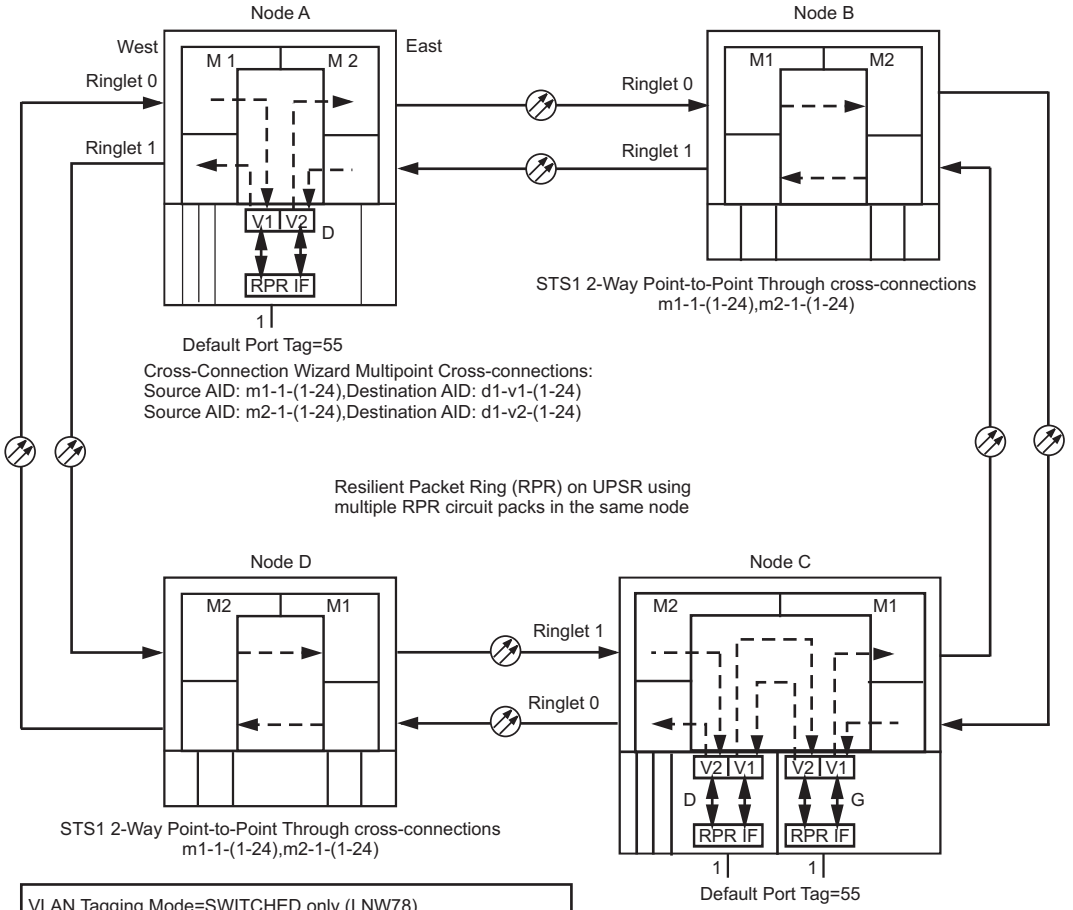
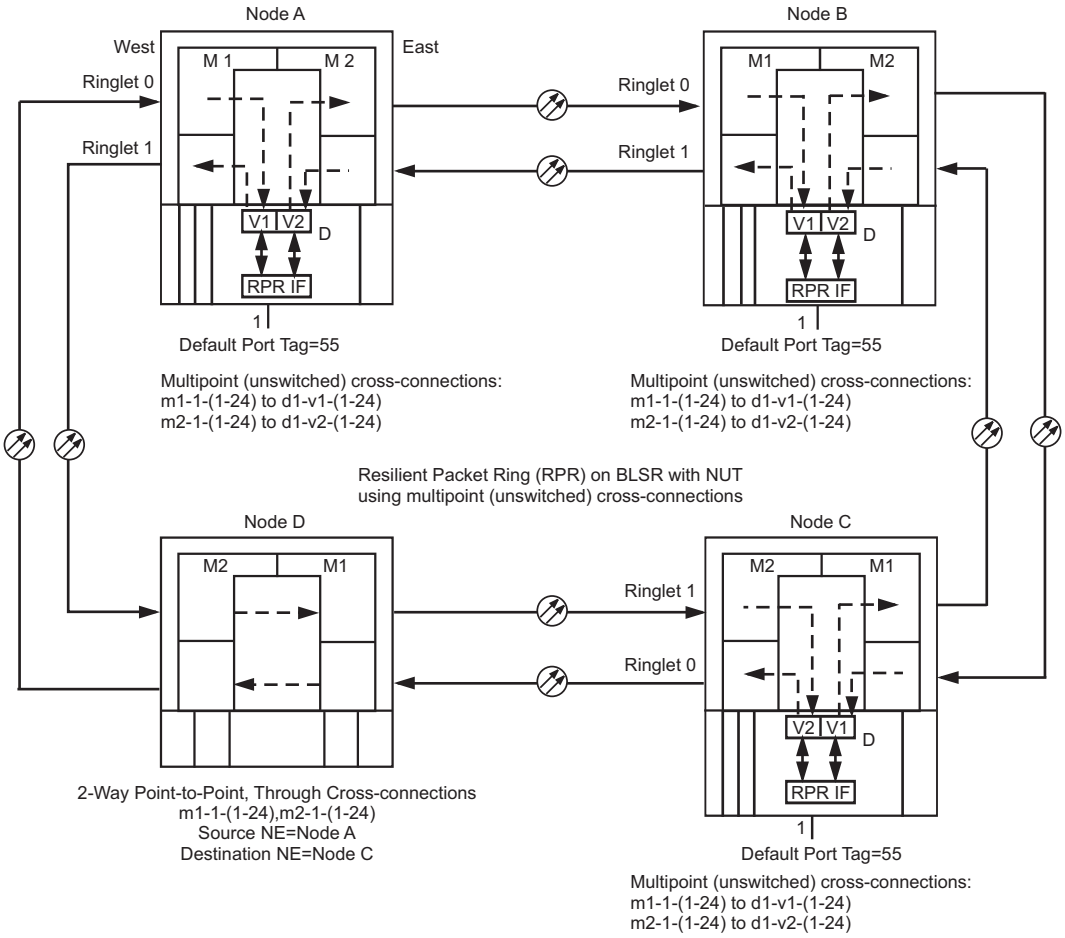


Figure 11-64 Resilient packet ring (RPR) on a BLSR



VLAN Tagging Mode=SWITCHED (LNW78)
Cross Connect Mode=STS1
Ed-eqpt:tid:fn-d-1:ctag::ETHPK:vlantagmd=switched,eccmode=sts1

Virtual Switch ID = 1 (LNW78)
Virtual LAN Tagging Mode=Transparent or 802.1TAG (LNW78)
Ent-vrtsw:tid:fn-d-1:ctag::1:eplst=d1-1,vcglst=d1-v1,tagmd=Trans

NUT Value for cross-connections:
Configuration > Equipment, select Ptn Grp, select BLSR protection group, click Select. Provision NUT Protection Attribute to “Not Protected” for all timeslots being used.

Cross-Connection Wizard Multipoint Cross-connections:
Source AID: m1-1-(1-24),Destination AID: d1-v1-(1-24)
Source AID: m2-1-(1-24),Destination AID: d1-v2-(1-24)

Create Port Tag
ed-eport-1ge:tid:d1-1:ctag:::dftporttag=55
ed-vcg-rpr:tid:d1-v1:ctag:::addporttag=55

MA-DMX-449

Figure 11-65 Resilient packet ring (RPR) on a main and subtending UPSR ring

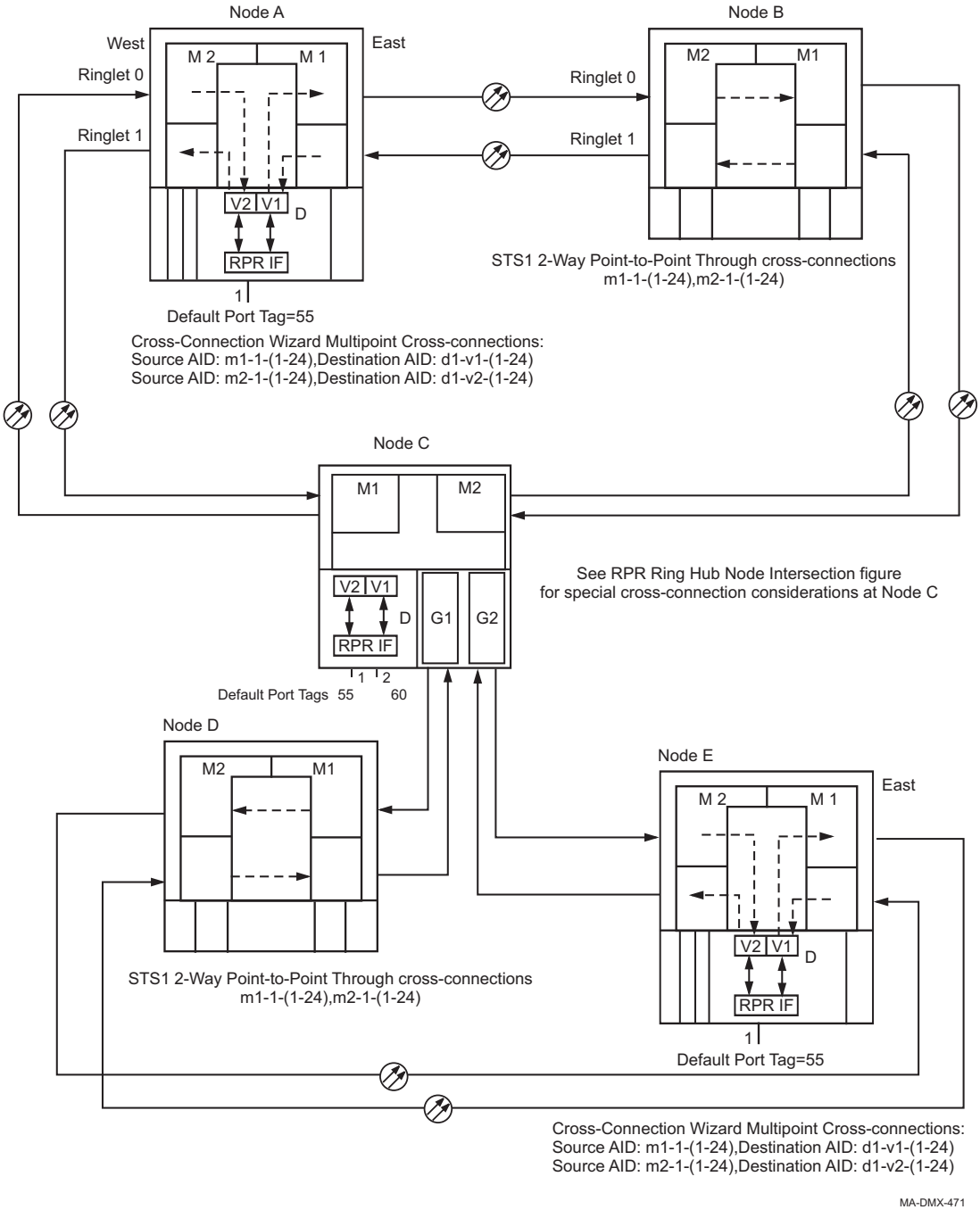
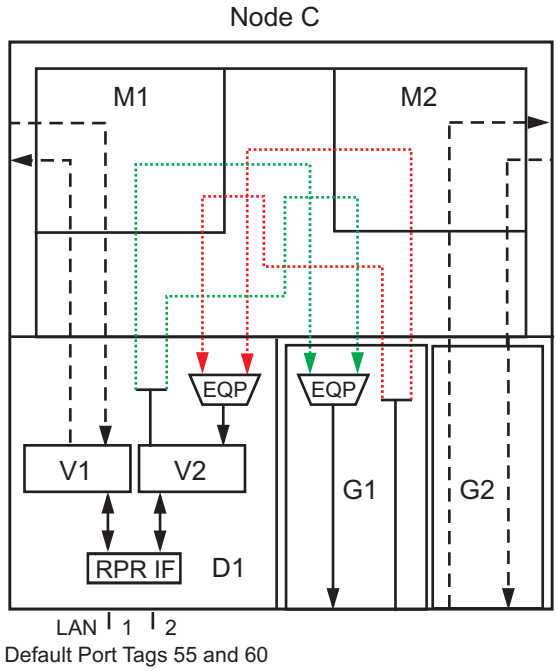


Figure 11-66 Resilient packet ring (RPR) hub node intersection cross-connections



Cross-Connection Wizard: Linear/Unprotected UPSR
Source AID: m1-1-(1-24),Destination AID: d1-v1-(1-24)

Cross-Connection Wizard: Linear/Unprotected UPSR (Unprotected option)
Source AID: m2-1-(1-24),Destination AID: g2-1-(1-24)

Cross-Connection Wizard: Linear/Unprotected UPSR
Source AID: g1-1-(1-24),Destination AID: d1-v2-(1-24)

MA-DMX-472

Procedure 11-45: Provision Ethernet quality of service (QoS) - LNW78

Overview

Use this procedure as a reference to provision Ethernet Quality of Service (QoS) on an LNW78. Refer to the section at the end of these steps for a detailed overview.

Important! This procedure applies only to LNW78 circuit packs.

To provision Ethernet Quality of Service for an LNW70/LNW170, refer to Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248).

Privilege level

You must login at least as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports, being provisioned.
- The type of QoS service being provisioned and all the related parameter values.

All the required regular Ethernet service parameters must have already been provisioned using the procedures in this chapter. This includes any packet rings, vlan tagging modes, customer vlan/port tags, virtual switches, and related LAN and VCG port parameters.

Important! Parameters only apply if the port is a member of a virtual switch.

Steps

Use the following to provision a QoS service.

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Use the **Configuration** → **Equipment** command from the System View menu, select the circuit pack, then select the Ethernet LAN port being provisioned. Click on the **QoS** tab. Provision the QoS parameters as required. Or, use the **`ed-eport`** TL1 command to provision the parameters.

Verify your settings, then click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

Repeat this step for each port in the network service.

References: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

3 Use the **Configuration** → **Equipment** command from the System View menu, select the circuit pack, then select the VCG port being provisioned.

For RPR IF VCG ports (v1), click on the **Queue Management** tab. Provision the queue management parameters, as required. For RPR VCG ports (v1 or v2), click on the **RPR Span** tab. Provision the RPR shaper parameters, as required. Or, use the **`ed-vcg-rpr/ed-rpr`** TL1 commands to provision the parameters.

For LNW78 Ethernet over SONET (EoS) ports (v17 - v22), click on the **QoS** tab. Provision the parameters, as required. Or, use the **`ed-vcg`** TL1 commands to provision the parameters.

Queue Management parameters apply to VCG v1 only. **RPR Span** parameters apply to both VCG v1 and v2.

Verify your settings, then click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

Repeat this step for each port in the network service.

References: Procedure 11-12: "Provision Ethernet VCG parameters" (p. 11-89)

Procedure 11-41: "Provision Resilient Packet Ring (RPR)-capable VCG parameters" (p. 11-308)

Procedure 11-42: "Provision Resilient Packet Ring (RPR)-specific VCG parameters" (p. 11-313)

4 Use the **Configuration** → **Data** → **Provision QoS Service** command from the System View menu, select the circuit pack, then select the port being provisioned. Or, use the **`ed-erate`** TL1 command to provision the parameters for the QoS service.

Verify your settings, then click **Apply**. Read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

Reference: Procedure 11-32: "Provision Ethernet QoS parameters" (p. 11-254)

END OF STEPS

Ethernet QoS

Use as a reference to provision Ethernet Quality of Service (QoS).

The Alcatel-Lucent 1665 DMX uses the differentiated services (DiffServ) model for the QoS feature. Traffic flow to the network is regulated only at the ingress ports.

The DiffServ model has two types of ports:

- Boundary port - port at the edge of the DiffServ domain.
- Interior port - port internal to the DiffServ domain.

LNW78 LAN ports and Ethernet over SONET (EoS) VCG ports may be boundary only. LNW78 RPR VCG ports are Interior only.

In addition to port types, port roles are assigned to control how tags are assigned/removed/processed:

- Customer port — Initial and only allowed value for LNW78 LAN ports and Ethernet over SONET (EoS) VCG ports.
- Network port — Initial and only allowed value for LNW78 RPR VCG ports.

QoS Services/Traffic Management Modes

A basic QoS service is defined as a particular traffic flow that uses a single traffic conditioner. A number of services can be provisioned at a Boundary port. The configuration of these services is defined as one of two traffic management modes (**`trafmgmtmd`**). The mode specifies how the packets will be divided into traffic flows and the services that can be provided at the port. All services at one port must be in the same traffic management mode. The total number of QoS services on the LNW78 circuit pack is 400.

The traffic management modes are defined as follows:

- PORT mode - Allowed in all VLAN tagging modes. One QoS service per port.
- COSPORT mode - Allowed only in 802.1TAG mode. One QoS service and one TC for each Class of Service (CoS) at the port.

Selection of these port parameters may be done using the **`ed-eport`** and **`ed-vcg`** TL1 command, or **Configuration** → **Equipment** from the *WaveStar*® CIT system menu, selecting the port, then clicking on the **QoS** tab. Select the Traffic Management Mode.

Classes of Service

Data packets classified at the ingress port result in unique traffic flows. Multiple flows can be mapped into a single Class of Service (COS). There may be up to three classes of service (CoS level 3, 2, and 1) corresponding to RPR classes A, B, and C, respectively. Class A has guaranteed bandwidth and lowest latency. Class B can have guaranteed bandwidth and bounded latency and can also have access to opportunistic bandwidth. Class C has no guarantees and only access to opportunistic bandwidth.

Selection of these parameters may be done using the **ent/ed-erate** TL1 commands, or **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT system menu, then selecting the port.

Traffic Conditioning

Traffic conditioning is performed on the ingress packets at Boundary Ports by metering the packets and either marking or policing as appropriate. This is used to enforce the guarantees and limitations specified in a Service Level Agreement (SLA). Within the network, queueing and scheduling functions provide a network that is engineered to satisfy all of the attached customers' SLA requirements.

Traffic Conditioner Parameters

Traffic Conditioner (TC) parameters include PIR, CIR, PBS, and CBS.

- PIR - Peak Information Rate. This is the peak information rate of the traffic conditioner function in Mbps. This is the PIR for the service addressed by the trafmgmtmd, port aid, tagid and cos. Value is from 0 to 1000. A value of 0 means that the PIR function is bypassed and there is no policing of the traffic. The value of PIR must be greater than or equal to CIR. PIR does not apply to CoS Level 3.
- CIR - Committed Information Rate. This is the committed information rate of the traffic conditioner function in Mbps for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is from 0 to 1000. The value of cir must be less than or equal to pir. A value of 0 means that there is no network commitment on incoming traffic. All traffic will be considered excess traffic. CIR does not apply to CoS Level 1.
- PBS - Peak Burst Size. This is the peak burst size in kilobytes for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is from 1 to 255. PBS does not apply to CoS Level 3.
- CBS - Committed Burst Size. This is the committed burst size in kilobytes for the service addressed by the trafmgmtmd, port aid, tagid, and cos. Value is from 1 to 255. The value of CBS must be less than or equal to PBS. In case of Private Line (vlantagmd set to NOTAG), the CBS value cannot be set (it inherits the PBS value). CBS does not apply to CoS Level 1.

Selection of these parameters may be done using the **ent/ed-erate** TL1 commands, or **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT system menu, then selecting the port.

Metering, Policing, and Color Marking

Metering measures the data rate with conformance levels determined by three color markers:

- Red - data rates greater than the PIR or PBS.
- Yellow - data rates less than or equal to PIR or PBS, but greater than CIR or CBS.
- Green - data rates less than or equal to CIR or CBS.

Policing discards red packets at the boundary ports. The remaining yellow and green packets determine drop precedence (DP).

Packets ingressing at boundary ports are remarked. Packets user priority is altered to reflect COS and DP. In COSPORT mode, user priority bit values map to the specified COS value as specified in IEEE 802.17a-2004.

In PORT mode, the traffic class is set for all packets that ingress the port and the COS value is set based on the default priority of the port. The COS value is inserted into the packet prior to egressing the NE.

Selection of these parameters may be done using the **ent/ed-erate** TL1 commands, or **Configuration** → **Data** → **Provision QoS Service** from the *WaveStar*® CIT system menu, then selecting the port.

Queue Management

Each port supports configurable thresholds expressed as a percentage of the total queue allocation. Each queue is controlled by setting the size of the queues, the queue weights and the drop thresholds for yellow and green packets. The performance of each CoS level is controlled by setting the dropping probabilities for each CoS level. Traffic that was admitted into the network within the terms of a Service Level Agreement (SLA) can be differentiated and given preferential treatment at the queue in order to satisfy the SLA service guarantees.

Selection of these port parameters may be done using the **ed-eport**, **ed-vcg** and **ed-vcg-rpr** TL1 commands, or **Configuration** → **Equipment** from the *WaveStar*® CIT system menu, selecting the port, then clicking on the **QoS** tab. Select the Traffic Management Mode.

The following TL1 command (*WaveStar*® CIT) parameters determine the maximum queue size and the minimum and maximum dropping thresholds for yellow and green packets:

- qsz - Maximum queue size. **Total Queue Size (in Kbytes)**
- qminthldg - Minimum dropping threshold for green packets. **Green Packet Min Drop Threshold (in %)**
- qmaxthldy - Maximum dropping threshold for yellow packets. **Yellow Packet Max Drop Threshold (in %)**
- qminthldy - Minimum dropping threshold for yellow packets. **Yellow Packet Min Drop Threshold (in %)**

The following TL1 command (*WaveStar*® CIT) parameters determine the maximum drop probability for COS 1, 2, 3 packets:

- qdropwt1 - Specifies maximum drop probability for COS 1 packets. **CoS 1 Packets Drop Probability Mark (in %)**
- qdropwt2 - Specifies maximum drop probability for COS 2 packets. **CoS 2 Packets Drop Probability Mark (in %)**
- qdropwt3 - Specifies maximum drop probability for COS 3 packets. **CoS 3 Packets Drop Probability Mark (in %)**

RPR traffic shapers

RPR shapers govern the aggregate amount of class A and class B traffic ingressing on the RPR ring, and should typically be set to at least the sum of the CIR's for each class from all the LAN ports.

Provisioning of these port parameters may be done using the **`ed-rpr`** TL1 command, or **Configuration** → **Equipment** from the *WaveStar*® CIT system menu, selecting the port, then selecting **RPR Span**.

The following TL1 command (*WaveStar*® CIT) parameters determine the maximum rate that Class A or B traffic is allowed to be added to each ringlet:

- rsv_a - Specifies the maximum rate that Class A traffic can be added to each ringlet. It controls the Class A shaper. **Reserved Class A Add Rate (Mb/sec):**
- rsv_b - Specifies the maximum rate that Class B traffic can be added to each ringlet. It controls the Class B shaper. **Reserved Class B Add Rate (Mb/sec):**

Procedure 11-46: Create/Modify/Delete link aggregation group (LAG)

Overview

Link Aggregation allows one or more Ethernet links to be combined (aggregated) into a link aggregation group (LAG) which acts like a single logical link. The Link Aggregation Control Protocol (LACP), defined in IEEE Std 802.3™-2002 is a protocol which allows for multiple MAC interfaces to act like one logical interface.

The LNW70/LNW170 Ethernet circuit packs supports implementation of the LACP protocol to allow LAGs to be created with up to 2 ports. The LAG provisioning is supported in the Switched VLAN tagging mode on LAN ports only.

For the LNW70 and unprotected LNW170, the LAG is created with two LAN ports on the same circuit pack. For the LNW170 protected, equipment protection is provided by creating LAG groups with two LAN ports each on separate circuit packs.

The **Configuration** → **Data** → **Create/Modify/Delete LA Group** command (**`ent-lagrp/ed-lagrp/dlt-lagrp`** TL1 command) from the System View menu allows you to create/delete or modify a LAG on the LNW70 or an unprotected LNW170. LAN ports are managed using the **Configuration** → **Equipment** command (**`ed-eport`** TL1 command) from the System View menu.

LAG groups on protected LNW170 circuit packs are created using the **Configuration** → **Equipment** command (**`ed-eqpt`** TL1 command) from the System view menu to set the Slot Protection State to PROT and configure related parameters.

See "Link Aggregation" (p. 11-344), "LAG rules for unprotected LNW70/LNW170" (p. 11-346), "LAG rules for protected LNW170" (p. 11-347)and "LAG definitions" (p. 11-349) at the end of this procedure for additional information.

> **Important!** It is recommended that cables associated with members of a LAG not be connected until the group is defined, else a loop may be formed.

Privilege level

You must login at least as a General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports being provisioned.
- The LAN ports and LAG group parameters being assigned.

Steps

Use the following procedures to create, modify, or delete a link aggregation group (LAG).:

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Perform the following procedures as required:

- Procedure 11-46.1: "Create/Modify/Delete LAG on LNW70/LNW170 (unprotected)" (p. 11-350)
- Procedure 11-46.2: "Create LAG on new LNW170 circuit packs (protected)" (p. 11-356)
- Procedure 11-46.3: "Create LAG, both slots already equipped with LNW170 circuit packs with VLF Mains" (p. 11-360)
- Procedure 11-46.4: "Create LAG, one slot already equipped with LNW170 circuit pack with VLF Mains" (p. 11-364)
- Procedure 11-46.5: "Create LAG, one slot already equipped with LNW170 circuit pack with non-VLF Mains" (p. 11-369)
- Procedure 11-46.6: "Delete LAG on LNW170 (change protected to unprotected)" (p. 11-373)

END OF STEPS

Link Aggregation

Link aggregation allows one or more links to be combined into one logical group of point-to-point links operating at the same data rate. The Link Aggregation Control Protocol (LACP), defined in IEEE Std 802.3™-2002, facilitates the aggregation function between the two ends of the logical link, but is not required. Aggregation can be forced when the protocol is set to NONE.

The **Configuration** → **Data** → **Create/Modify/Delete LA Group** command (**`ent-lagrp/ed-lagrp/dlt-lagrp`** TL1 command) from the System View menu allows you to modify LAGs or create or delete a LAG on the LNW70 or unprotected LNW170. LAG groups on protected LNW170 circuit packs are created using the **Configuration** → **Equipment** command (**`ed-eqpt`** TL1 command) from the System view

menu to set the Slot Protection State to PROT and configure related parameters. See Table 11-15, "ENT-LAGRP command provisionable parameters" (p. 11-345) for a list of LAG provisionable parameters.

Additional LAN port LAG related parameters are provisioned using the TL1 **ed-eport** command or **Configuration** → **Equipment** from the System View menu.

See Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

ENT-LAGRP command parameters

Table 11-15, "ENT-LAGRP command provisionable parameters" (p. 11-345) lists the provisionable parameters for the **ent-lagrp** command.

Table 11-15 ENT-LAGRP command provisionable parameters

Parameter	Description
aid	**LA Group AID.** This is the address of the Link Aggregation Group (LAG). The LAG must not already exist. The aid is that of a function or growth group (for example d-lag3). There may be up to 8 LAGs for the group in a 0x1 configuration with a maximum of 4 per circuit pack.
leadport	**Lead Port.** Values: An Ethernet/LAN port AID. This is a mandatory parameter. The Lead Port must be in the same function group as the LAG aid. It must already be in a Virtual Switch. The lead port's membership in the VS is transferred to the LAG, as well as VLAN memberships and QoS services. Other Layer 2 provisioning (ed-eport) is also copied to the LAG. As a result, service on the Lead Port is continued on the LAG.
eplst	**Member Port AID(s).** Value: An Ethernet/LAN port AID. The Member Port must be in the same function group circuit pack and at the same rate as the leadport. It must NOT be a member of another LAG and NOT a member of a Virtual Switch.

Table 11-15 ENT-LAGRP command provisionable parameters (continued)

Parameter	Description
hashtype	**Hash Type** The basis for assigning a conversation to a link. . Valid values are: • MAC - Use Source Address/Destination Address (SA/DA) (initial value) • IP - Use Source IP Address/Destination IP Address (SIP/DIP). This may allow better load distribution when connected to a router where the MAC SA/DA are constant or nearly constant and the traffic is IP.
protocol	**Protocol**. The protocol used for Link Aggregation. Valid values: • LACP - IEEE Std 802.3™-2002 Link Aggregation Control Protocol (initial value). • NONE - Aggregation among members is forced. Any Link Aggregation protocol messages received are ignored and none are sent.
asmode	Active/Standby Mode. Values: • ENABLE — active/standby mode is enabled. The value is valid only when LACP is enabled (protocol = LACP). • DISABLE — active/standby mode is disabled. The LAG is in Load Balanced Mode (initial value)
actsyspri	Actor System Priority. Specifies the system priority for a LAG. Value: an integer in the range 0 to 65535. The initial value is 32768.

LAG rules for unprotected LNW70/LNW170

The following lists some rules for link aggregation on unprotected LNW70/LNW170 circuit packs:

- Applies to the LNW70/LNW170 in Switched mode only in any function or growth group. Uses LAN ports only.
- On unprotected LNW70/LNW170 circuit packs, two ports maximum per LAG. Any pair of ports of the same rate, all on the same pack. The maximum number of LAG groups for the same pack is four. The maximum number for two independent packs in the same function group is eight. LAG numbers 1 - 8 valid.

- The LAG transfers memberships and services (VLAN's, VS, ERATE services, static MAC entries, etc.) from the founding member (leadport) when created. Only the LAG is in a VS or VLAN, not the member ports. Other EPORT L2 provisioning is copied to the LAG (see "ED-EPORT Valid Parameters for LAG and Members"). The L2 parameters can be subsequently edited on the LAG only.
- For unprotected LNW70/LNW170, other members added to the LAG must not be in a VS, VLAN or have an ERATE service when added.
- For unprotected LNW70/LNW170, removed members, except the last, are not in a VS, VLAN, nor have services, and revert to their original L2 provisioning.
- For unprotected LNW70/LNW170, when the LAG is deleted, the last member inherits the current L2 parameter values, memberships, and services, from the LAG.
- Applicable L1 parameters for member ports remain independent per port; they do not apply to the logical port. Flow control allowed (all values are available).
- For unprotected LNW70/LNW170, deleting a LAG group is denied if there is more than one member in LAG. All but one member port must be removed from the LAG before the LAG can be deleted.
- The aggregator's MAC address is that of one of the member ports. LACP frames are sent with the member's MAC address for source address (SA).

LAG rules for protected LNW170

The following lists some rules for link aggregation on protected LNW170 circuit packs:

- Applies to the LNW170 in Switched mode only in any function or growth group. Uses LAN ports only.
- On protected LNW170 circuit packs, LAGs are created using the ed-eqpt command to set the slot protection state (prot_state) to protected (PROT).

  Prerequisites before provisioning the protection state to protected:

  For any type Main circuit pack:

  – One function/growth slot may be equipped with an LNW170, the other unequipped (AUTO).

  – No existing LAGs on the installed LNW170.

  – LAN Ports 3, 4, 7, 8 cannot be in a Virtual Switch.

  – Virtual LAN Tagging Mode (vlantagmd) must be set to SWITCHED.

  – After the ED-EQPT prot_state=PROT is accepted on the equipped slot then the AUTO slot "expects" an LNW170 (any other pack inserted causes "CP not allowed" alarm) and vlantagmd, eccmode, enetmd, taudit, and VCG parameters from ERATE, MAC, STGRP, VCG, VCGTRIB, VLAN, and VRTSW are copied to that slot.

  In addition to the above, for VLF Main circuit packs, when both slots are already equipped with LNW170 circuit packs.

  – No existing LAGs on either of the installed LNW170s.

  – Only the target slot can have cross-connections or Virtual Switches.

  - LAN Ports 3, 4, 7, 8 on either circuit pack cannot be in a Virtual Switch. Any PTMs installed in ports 3, 4, 7, or 8 must be removed.
  - Virtual LAN Tagging Mode (vlantagmd) must be set to SWITCHED on both.
  - Ethernet Cross Connect Mode (eccmode) and Transmission Audit (taudit) must be set the same on both circuit packs.
  - Port Configuration (enetmd) settings must result in the same rates on same-numbered ports of both circuit packs. For example, GT_FX and FT_FX are not compatible.

- When the command is accepted to change the Slot Protection State to protected (PROT):
  - A fixed number of the following four LAG groups consisting of ports on each circuit pack are automatically created: LAG1: fn-1-1, fn-2-1; LAG2: fn-1-2, fn-2-2; LAG3: fn-1-5, fn-2-5; LAG4: fn-1-6, fn-2-6. External LAN ports 3, 4, 7, and 8 are unused.
  - The pack targeted by the command provides Lead Ports for each LAG and becomes the Active-WAN circuit pack. It transfers memberships and services (VLAN's, Virtual Switch, ERATE services, static MAC entries, etc.) from the founding members (leadports) to its LAGs. Only the LAGs are in a VS or VLAN, not the member ports. VCG parameters are copied from the Active-WAN pack to the companion circuit pack. The L2 parameters can be subsequently edited on the LAGs only.
  - A 1+1 EQPT protection group is created and cross-connections become equipment protected (now using the slot 1 AID).
- When in the protected mode (prot_state=PROT):
  - Ethernet command parameters specifying a slot AID, and others affecting VCG's, applied on either slot affect both slots with the exception of the Port Configuration parameter (enetmd). Enetmd can be applied individually when the change is to the type (optical or electrical) and not the rate.

    The VLAN Tagging Mode (vlantagmd) cannot be changed from SWITCHED.

    Cross-connections are provisioned and reported using the slot 1 AID only.
  - Only one circuit pack is "in service," meaning its VCG's are selected by the mains. When both LAG members are normal, both circuit packs may be carrying LAN service. Because of this the circuit pack Switch States are not named "active" and "standby," but "Active-WAN" and "Inactive-WAN,"
  - Applicable L1 parameters for member ports remain independent per port; they do not apply to the logical port. Flow control allowed (all values are available).
  - The aggregator's MAC address is that of one of the member ports. LACP frames are sent with the member's MAC address for source address (SA).
- On a protected LNW170, LAG's are deleted by changing the Slot Protection State to UNPROT (ed-eqpt prot_state=unprot). The command may address either slot.

When the command is accepted to change the Slot Protection State to UNPROT:

- The ports of the slot aid addressed to change the Slot Protection State inherit LAG L2 parameters, cross-connections become unprotected, and LAG's are deleted.
- The other slot has no cross-connections or virtual switches and all provisioning is set to default (as if the pack were newly inserted). PM counters are reset.
- The protection group is deleted. For non-VLF Mains, the other slot reverts to “no CP allowed”.

- All LAG’s exist with member ports, but are not initially in a Virtual Switch. ENT-LAGRP is not used. No LAN ports exist outside a LAG. ED-LAGRP is only used to set parameters, not membership. ENT/ED-VRTSW is used on LAG’s, and VCG’s.

LAG definitions

The following lists some standard LAG definitions:

- LACPDU (Link Aggregation Control Protocol Data Units): Message type exchanged between protocol “participants”.
- Participant: Refers to the local (actor) or remote (partner) system participating in protocol exchanges.
- Conversation: A set of MAC frames transmitted from one end station to another, where all of the MAC frames form an ordered sequence, and where the communicating end stations require the ordering to be maintained among the set of MAC frames exchanged.
- Actor: The local entity in a Link Aggregation Control Protocol exchange.
- Partner: The remote entity in a Link Aggregation Control Protocol exchange.
- Hash: A function for determining assignment to, or distribution among, entities based on identifying information. For Link Aggregation, it is used to assign a conversation (defined by the hash type) to a particular link, to avoid misordering.
- LACP Activity: If set to Active, indicates a participant transmits periodically to detect and maintain the aggregate. If set to Passive, indicates the participant will participate in the protocol exchange if there is an active partner.
- LACP Timeout: Specifies the rate at which periodic transmissions of LACPDUs occur.
- Aggregator: Term used in IEEE Std 802.3™-2002 for the aggregation function of a Link Aggregation Group.

Procedure 11-46.1: Create/Modify/Delete LAG on LNW70/LNW170 (unprotected)

Overview

Use this procedure to create/modify/delete LAG groups on the LNW70 or an unprotected LNW170.

The **Configuration** → **Data** → **Create/Modify/Delete LA Group** command (**`ent-lagrp/ed-lagrp/dlt-lagrp`** TL1 command) from the System View menu allows you to create/delete or modify a LAG on the LNW70 or an unprotected LNW170. LAN ports are managed using the **Configuration** → **Equipment** command (**`ed-eport`** TL1 command) from the System View menu.

See "Link Aggregation" (p. 11-344), "LAG rules for unprotected LNW70/LNW170" (p. 11-346), "LAG rules for protected LNW170" (p. 11-347) and "LAG definitions" (p. 11-349) for additional information.

Important! It is recommended that cables associated with members of a LAG not be connected until the group is defined, else a loop may be formed.

Privilege level

You must login at least as a General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports being provisioned.
- The LAN ports and LAG group parameters being assigned.

  Important! This procedure assumes that the LNW70/LNW170 circuit pack has already been installed into the shelf. See Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66).

Steps

Use the following procedure to create, modify, or delete a link aggregation group (LAG).:

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Select one of the following:

If...	Then...
you are creating a LAG group on a new circuit pack not yet in service,	continue with Step 3.
you are creating a LAG group on an in-service circuit pack/port,	continue with Step 10.
you are modifying an existing LAG group,	proceed to Step 14.
you are deleting a LAG group,	proceed to Step 17.

CREATE NEW LAG

3



NOTICE

Service-disruption hazard

If the Ethernet circuit pack is already providing service, changing tagging mode will take down any existing service. The existing tagging mode cannot be changed without removing all existing cross-connections and virtual switch provisioning.

Determine the existing tagging mode for the circuit pack being provisioned. Use the TL1 **`rtrv-eqpt`** command or select **View** → **Equipment** from the System View menu, select the CP, then click **Select**. Note the VLAN Tagging Mode and other parameter values.

The VLAN Tagging Mode for the LNW70/LNW170 circuit packs must be set to **`SWITCHED`**.

Changing the vlantagmd is service affecting. Changing from NOTAG mode to another mode may result in an inconsistency between the mode and cross-connects that have been set. This will cause a tag-mode and cross-connect inconsistency alarm.

4 Select the **Configuration** → **Equipment** command from the System View menu (or use the TL1 **`ed-eqpt`** command), select the circuit pack being provisioned, then click **Select**.

5 Verify/Select the tagging mode **`SWITCHED`** in the **VLAN Tagging Mode** box..

6 Verify/Enter other parameter values (for example, **Ethernet Cross Connect Mode** and **Port Configuration**, as required, then click **OK**.

Reference: Procedure 11-13: "Provision Ethernet circuit pack parameters" (p. 11-103)

7 Determine the LAN ports required for the LAG group(s). LAN ports must be the same rate.

8 Use the TL1 **ed-eport** command to provision the lead port (leadport) LAN port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, highlight the LAN Port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

9 **Important!** The first LAN port (leadport) assigned to the LAG group being created must already be a member of a virtual switch. The second member port of the LAG must NOT be a member of a virtual switch.

Use the **rtrv-vrtsw** TL1 command or **View** → **Data** → **Virtual Switch** to determine the assignment of virtual switches for the port(s) being provisioned.

Creating virtual switches using the **ent-vrtsw** TL1 command or **Configuration** → **Data** → **Create Virtual Switch** command from the System View menu requires you to select the circuit pack and provision the following parameters :

- **Virtual Switch ID** (**vrtswid**) - Value in the range of 1-16 for the LNW70/LNW170 circuit packs.
- **Virtual LAN Tagging Mode** (**tagmd**) - Value of **802.1TAG** or **Transparent**.
- **Ethernet (LAN) Ports** (**eplst**) - List or selection of LAN ports associated with the virtual switch ID.
- **VCG (WAN) Ports** (**vcglst**) - List or selection of VCG ports associated with the virtual switch ID.

Assign Virtual Switch ID.

- *For circuit packs/ports not yet in service with no virtual switch assigned:*
  - Select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu (or use the TL1 **ent-vrtsw** command) to create an assigned virtual switch ID for the LAG *leadport*.

For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

- *For circuit packs/ports not yet in service with a virtual switch assigned:*
  - If a different virtual switch ID is required or to remove a member port from the virtual switch, select **Configuration** → **Data** → **Delete Virtual Switch** command from the CIT System View menu (TL1 **`dlt-vrtsw`** command) to delete an assigned virtual switch ID, or select **Configuration** → **Data** → **Provision Virtual Switch** command from the CIT System View menu (TL1 **`ed-vrtsw`** command) to remove a member port from the existing virtual switch.
  - Select **Configuration** → **Data** → **Create Virtual Switch** command from the CIT System View menu (or use the TL1 **`ent-vrtsw`** command) to create a new virtual switch ID for the selected LAG leadport, if required.

    For the LNW70/LNW170 circuit pack, select the required **Virtual LAN Tagging Mode** (**802.1TAG** or **Transparent**).

10 The first LAN port (leadport) assigned to the LAG group being created must already be a member of a virtual switch. The second member port of the LAG must NOT be a member of a virtual switch.

Select **Configuration** → **Data** → **Create/Modify/Delete LA Group** command from the CIT System View menu (or use the TL1 **`ent-lagrp`** command) to create the LAG group. Select the circuit pack and provision the parameters as required.

Reference: Table 11-15, “ENT-LAGRP command provisionable parameters” (p. 11-345)

11 If required, use the TL1 **`ed-eport`** command to provision the LAN port and LAG port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, select the LAG group or expand the details for the LAG group, highlight the member LAN port, then click **Select**. Provision the parameters as required.

Note that these parameters may have already been inherited from the leadport when the LAG was created. The lead port's membership in the VS is transferred to the LAG, as well as VLAN memberships and QoS services. Other Layer 2 provisioning (ed-eport) is also copied to the LAG. Use the **View** → **Equipment** command from the System View menu to select the port and verify provisioning.

Reference: Procedure 11-11: “Provision Ethernet LAN port parameters” (p. 11-70)

12 A default port tag (Virtual LAN tagging mode Transparent) or default VLAN (Virtual LAN tagging mode 802.1 Tag) must be provisioned for the LAG group in order to pass any untagged frames.

Note that these parameters may have already been inherited from the leadport when the LAG was created. The lead port's membership in the VS is transferred to the LAG, as well as VLAN memberships and QoS services. Other Layer 2 provisioning (ed-eport) is also copied to the LAG. Use the **View** → **Equipment** command from the System View menu to select the port and verify provisioning.

Perform one of the following as required:

- Virtual LAN tagging mode — 802.1 Tag: Use the TL1 **`ent-vlan`** command or **Configuration** → **Data** → **Create VLAN** command from the System View menu to create the default VLAN for untagged traffic for the selected LAG group.
- Virtual LAN tagging mode — Transparent: Use the TL1 **`ed-eport`** command or **Configuration** → **Data** → **Create Port Tag** command from the System View menu to create the default Port Tag for untagged traffic for the selected LAG group.

13 If required, use the TL1 **`ent-erate`** command to provision/adjust the LAG related QoS parameters, or select **Configuration** → **Data** → **Provision QoS Service** from the System View menu. Expand the details for the circuit pack, highlight the LAG port, then click **Select**. Provision the parameters as required.

Note that these parameters may have already been inherited from the leadport when the LAG was created. The lead port's membership in the VS is transferred to the LAG, as well as VLAN memberships and QoS services. Other Layer 2 provisioning (ed-eport) is also copied to the LAG. Use the **View** → **Equipment** command from the System View menu to select the port and verify provisioning.

Reference: Procedure 11-31: “Provision Ethernet quality of service (QoS) - LNW70/LNW170” (p. 11-248)

END OF STEPS FOR CREATING LAG GROUP

14 MODIFY EXISTING LAG

Use the TL1 **`ed-lagrp`** command to modify the LAG, or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select (highlight) the circuit pack, then click **Select**.

Modifying a LAG consists of either adding or deleting a member port, changing the hashtype, or changing the protocol parameter. The LAG may consist of up to two LAN ports. You may delete all but one LAN port.

15 If you are adding or deleting a member LAN port, double click in the **Member Port AID(s)** box.

Result: The **Modify Member Ports** window opens.

Select an available port or remove a selected port, as required. Click **Apply** to execute the command.

16 Click twice in the **Hash Type** or **Protocol** box. Select the Hash Type or Protocol value, as required. Click **Apply**, read the warning message then click **Yes** to execute the command. Click **Close** to exit.

Reference: Table 11-15, "ENT-LAGRP command provisionable parameters" (p. 11-345)

END OF STEPS FOR MODIFYING LAG GROUP

17 DELETE EXISTING LAG

Use the TL1 **`dlt-lagrp`** command to modify the LAG , or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select the circuit pack.

Important! All but the last port must have been previously removed from the LAG before you can delete the LAG.

18 Click in the **Delete** box for the LAG being deleted. Click **Apply**, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

END OF STEPS

Procedure 11-46.2: Create LAG on new LNW170 circuit packs (protected)

Overview

Use this procedure to create LAG groups on new LNW170 circuit packs.

If an LNW170 is already installed/in-service in one of the function/growth slots, use Procedure 11-46.4: “Create LAG, one slot already equipped with LNW170 circuit pack with VLF Mains” (p. 11-364) or Procedure 11-46.5: “Create LAG, one slot already equipped with LNW170 circuit pack with non-VLF Mains” (p. 11-369) to create the LAG group.

Provisioning LAG groups on protected LNW170 circuit packs differs from provisioning LAG groups on unprotected LNW70/170 circuit packs. LAG groups on protected LNW170 circuit packs are automatically created by setting the Slot Protection State parameter to PROT on the pair of LNW170 circuit packs.

The general rules in provisioning a protected LNW170 service are:

- Equipping both slots in the Function/Growth group with LNW170 cards.
- Provisioning the VLAN Tagging Mode parameter (vlantagmd) to Switched.
- Provisioning the Ethernet Cross Connect Mode paramenter (eccmode) the same on both circuit packs.
- Provisioning the Port Configuration parameter (enetmd) the same on both circuit packs.
- Provisioning the Transmission Audit parameter (taudit) the same on both circuit packs.
- Provisioning the circuit pack Slot Protection State parameter (prot_state) to Protected (PROT).

  Important! It is recommended that cables associated with members of a LAG not be connected until the group is defined, else a loop may be formed.

Privilege level

You must login at least as a General user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to “Before you begin” (p. 11-4) and “Required equipment” (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail:

- The shelf slots, circuit packs, ports being provisioned.
- The LAN ports and LAG group parameters being assigned.

Steps

Use the following procedure to create a link aggregation group on protected LNW170 circuit packs.

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Install a LNW170 into function/growth slot 1.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

3 From the System View, select **Configuration** → **Equipment**, select the installed LNW170 100/1G FXS circuit pack in slot 1, then click **Select**. Provision the Slot Protection State to **PROT**, VLAN Tagging Mode to **SWITCHED**, Ethernet Cross Connect Mode, Transmission Audit, and Port Configuration from your work instructions. Provision other parameters as required.

Result: The LAG protection groups 1-4 are created and slot 1 **Switch State** becomes `Active-WAN`.

The unequipped slot becomes provisioned for a LNW170. The unequipped slot is also provisioned for VLAN Tagging Mode (vlantagmd) of SWITCHED, and for the same values of Ethernet Cross Connect Mode (eccmode), Port Configuration (enetmd), Transmission Audit (taudit) and VCG parameters as the installed LNW170 circuit pack.

4 Install a LNW170 into companion function/growth slot 2.

5 If required, use the TL1 **ed-eport** command to provision the LAG member LAN ports and LAG port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, select the LAG group or expand the details for the LAG group, highlight the member LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

6 If required, use the TL1 **`ent-erate`** command to provision the LAG related QoS parameters, or select **Configuration** → **Data** → **Provision QoS Service** from the System View menu. Expand the details for the circuit pack, highlight the LAG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248)

7 If required, use the TL1 **`ed-lagrp`** command to modify the LAG, or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select (highlight) the circuit pack, then click **Select**.

Modifying a LAG consists of changing the hashtype, or changing the protocol parameter.

- **Hash Type**
  The basis for assigning a conversation to a link.
  . Valid values are:
  - MAC - Use Source Address/Destination Address (SA/DA) (initial value)
  - IP - Use Source IP Address/Destination IP Address (SIP/DIP). This may allow better load distribution when connected to a router where the MAC SA/DA are constant or nearly constant and the traffic is IP.
- **Protocol**.
  The protocol used for Link Aggregation.
  Valid values:
  - LACP - IEEE Std 802.3™-2002 Link Aggregation Control Protocol (initial value).
  - NONE - Aggregation among members is forced. Any Link Aggregation protocol messages received are ignored and none are sent.

8 Click twice in the **Hash Type** or **Protocol** box. Select the Hash Type or Protocol value, as required. Click **Apply**, read the warning message then click **Yes** to execute the command. Click **Close** to exit.

9 As required, complete other L2 provisioning (for example, virtual switch, vlan, spanning tree groups, cross-connections) using the procedures in this chapter.

10 A default port tag (Virtual LAN tagging mode Transparent) or default VLAN (Virtual LAN tagging mode 802.1 Tag) must be provisioned for the LAG group in order to pass any untagged frames.

Perform one of the following as required:

- Virtual LAN tagging mode — 802.1 Tag: Use the TL1 **`ent-vlan`** command or **Configuration** → **Data** → **Create VLAN** command from the System View menu to create the default VLAN for untagged traffic for the selected LAG group.
- Virtual LAN tagging mode — Transparent: Use the TL1 **`ed-eport`** command or **Configuration** → **Data** → **Create Port Tag** command from the System View menu to create the default Port Tag for untagged traffic for the selected LAG group.

END OF STEPS

Procedure 11-46.3: Create LAG, both slots already equipped with LNW170 circuit packs with VLF Mains

Overview

This procedure assumes that existing unprotected LNW170 circuit packs are already installed in a Function/Growth slot pair and you want to establish protected LNW170 LAG groups. It also assumes that at least one of the circuit packs is provisioned with VLAN Tagging Mode of Switched and is in-service with virtual switches, cross-connections, and other parameters set as required.

On both slots equipped with LNW170 circuit packs:

- The VLAN Tagging Mode on both circuit packs must be set to SWITCHED.
- The Port Configuration must result in the same port rates on the companion LAG ports, ports 1, 2, 5 or 6, on the companion circuit packs.
- The Ethernet Cross Connect Mode and Transmission Audit parameters must be set the same on both circuit packs.
- There must not be any Link Aggregation Groups (LAGs) provisioned on either companion circuit pack.
- Only the circuit pack selected (working circuit pack) in setting Slot Protection State to PROT can be provisioned with cross-connections or virtual switches, and the provisioned virtual switches cannot be on ports 3, 4, 7 or 8. These ports will be unavailable after the Protection State is provisioned to PROT.

Steps

Complete the following steps to change the Slot Protection State from Unprotected to Protected for a Function/Growth group equipped with LNW170 100/1G FXS circuit pack(s):

1 **Important!** When both Function/Growth slots are equipped with LNW170 100/1G FXS circuit packs and both have virtual switches or cross-connections assigned, all virtual switches and cross-connections must be removed from one of the LNW170 circuit packs and also on ports 3, 4, 7 or 8 of both circuit packs. If service is being provided on the circuit pack having the virtual switches and/or cross-connections removed, the service must be moved/removed before continuing with this procedure.

If required, use the **Configuration** → **Data** → **Delete Virtual Switch** and/or **Configuration** → **Cross-Connections** command to delete the required virtual switches or cross-connections.

2 **Important!** Any PTMs installed in ports 3, 4, 7, or 8 must be removed.

Remove any PTM's from ports 3, 4, 7, or 8 on both LNW170 circuit packs.

3 **Important!** No provisioned Link Aggregation Groups can exist on the LNW170 100/1G FXS circuit pack(s).

From the System View, select **View** → **Data** → **LA Group**, select (highlight) the required LNW170 100/1G FXS circuit pack, then click **Select**. Verify that no Link Aggregation Groups exist on the circuit pack.

If required, select **Configuration** → **Data** → **Create/Modify/Delete LA Group** to delete any Link Aggregation Groups on the required LNW170 100/1G FXS circuit pack.

Reference: Procedure 11-46: "Create/Modify/Delete link aggregation group (LAG)" (p. 11-343)

4 From the System View, select **Configuration** → **Equipment**, select the LNW170 100/1G FXS circuit pack that has no provisioning, then click **Select**. Provision the **VLAN Tagging Mode** to **SWITCHED**, **Ethernet Cross Connect Mode**, **Transmission Audit** and **Port Configuration** rates the same as on the working companion circuit pack. Provision other parameters as required.

If required, select the "working" companion LNW170 100/1G FXS circuit pack, then click **Select**. View the existing parameter settings to be used.

5 **NOTICE**

Service-disruption hazard

Changing the Slot Protection State of the LNW170 100/1G FXS circuit pack causes a circuit pack reset which may take up to several minutes to complete and disrupt service.

Wait until the circuit pack reset is complete before performing additional provisioning.

From the System View, select **Configuration** → **Equipment**, select the "working" LNW170 100/1G FXS circuit pack that has provisioned cross-connections or virtual switches, then click **Select**. Provision the **Slot Protection State** to **PROT**.

Result:

- The services and L2 provisioning on the working circuit pack ports 1, 2, 5, and 6 are transferred to LAG groups 1, 2, 3, and 4, respectively.
- The same port numbers on the companion slot are members of those LAG's.

- Any ports not in use on the working circuit pack remain so but are members of their preassigned LAG's.
- A protection group is created and the working circuit pack **Switch State** becomes `Active-WAN`.

Reference: Procedure 4-14: "Provision Ethernet circuit pack/LAN port/VCG for service" (p. 4-73)

6 Select **View** → **Equipment** to access the affected circuit packs and verify that the Slot Protection State changed to Protected.

7 If required, use the TL1 **`ed-eport`** command to provision the LAG member LAN ports and LAG port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, select the LAG group or expand the details for the LAG group, highlight the member LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

8 If required, use the TL1 **`ent-erate`** command to provision the LAG related QoS parameters, or select **Configuration** → **Data** → **Provision QoS Service** from the System View menu. Expand the details for the circuit pack, highlight the LAG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248)

9 If required, use the TL1 **`ed-lagrp`** command to modify the LAG, or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select (highlight) the circuit pack, then click **Select**.

Modifying a LAG consists of changing the hashtype, or changing the protocol parameter.

- **Hash Type**
  The basis for assigning a conversation to a link.
  . Valid values are:
  – MAC - Use Source Address/Destination Address (SA/DA) (initial value)
  – IP - Use Source IP Address/Destination IP Address (SIP/DIP). This may allow better load distribution when connected to a router where the MAC SA/DA are constant or nearly constant and the traffic is IP.
- **Protocol**.
  The protocol used for Link Aggregation.

Valid values:

– LACP - IEEE Std 802.3™-2002 Link Aggregation Control Protocol (initial value).

– NONE - Aggregation among members is forced. Any Link Aggregation protocol messages received are ignored and none are sent.

10 Click twice in the **Hash Type** or **Protocol** box. Select the Hash Type or Protocol value, as required. Click **Apply**, read the warning message then click **Yes** to execute the command. Click **Close** to exit.

11 As required, complete other L2 provisioning (for example, virtual switch, vlan, spanning tree groups, cross-connections) using the procedures in this chapter.

12 A default port tag (Virtual LAN tagging mode Transparent) or default VLAN (Virtual LAN tagging mode 802.1 Tag) must be provisioned for the LAG group in order to pass any untagged frames.

Perform one of the following as required:

- Virtual LAN tagging mode — 802.1 Tag: Use the TL1 **`ent-vlan`** command or **Configuration** → **Data** → **Create VLAN** command from the System View menu to create the default VLAN for untagged traffic for the selected LAG group.
- Virtual LAN tagging mode — Transparent: Use the TL1 **`ed-eport`** command or **Configuration** → **Data** → **Create Port Tag** command from the System View menu to create the default Port Tag for untagged traffic for the selected LAG group.

END OF STEPS

Procedure 11-46.4: Create LAG, one slot already equipped with LNW170 circuit pack with VLF Mains

Overview

This procedure assumes that an existing "working" unprotected LNW170 circuit pack is already installed in the shelf and you want to establish protected LNW170 LAG groups. It is assumed the existing LNW170 VLAN Tagging Mode is provisioned as SWITCHED and is in service.

The following is required after both slots are equipped with LNW170 circuit packs, before changing the Slot Protection State to PROT:

- The VLAN Tagging Mode on both circuit packs must be set to SWITCHED.
- The Port Configuration must result in the same port rates on the companion LAG ports (ports 1, 2, 5 or 6) on the companion circuit packs. For example, GT_FX and FT_FX are NOT compatible.
- The Ethernet Cross Connect Mode and Transmission Audit parameters must be set the same on both circuit packs.
- There must not be any Link Aggregation Groups (LAGs) provisioned on either companion circuit pack.
- Only the circuit pack selected in setting Slot Protection State to PROT can be provisioned with cross-connections or virtual switches, and the provisioned virtual switches cannot be on ports 3, 4, 7 or 8. The ports will be unavailable after the Protection State is provisioned to PROT.

Steps

Complete the following steps to change the Slot Protection State from Unprotected to Protected for a Function/Growth group equipped with LNW170 100/1G FXS circuit pack(s):

1 **Important!** If the Function/Growth group is equipped with a working LNW170 100/1G FXS circuit pack and the companion circuit pack is a different circuit pack type, the companion circuit pack must be removed before changing the Slot Protection State to Protected. Two circuit packs that are different circuit pack types are not compatible when the Slot Protection State is Protected.

If required, remove the companion circuit pack from the affected Function/Growth group according to local procedures and select **Configuration** → **Update System** → **Update All**.

2 **Important!** All virtual switches and cross-connections must be removed from ports 3, 4, 7 and 8 on the installed working circuit pack. If service is being provided on those ports, the service must be moved/removed before continuing with this procedure.

If required, use the **Configuration** → **Data** → **Delete Virtual Switch** and/or **Configuration** → **Cross-Connections** command to delete the required virtual switches or cross-connections on ports 3, 4, 7 and 8.

3 **Important!** Any PTMs installed in ports 3, 4, 7, or 8 must be removed.

Remove any PTM's from ports 3, 4, 7, or 8 on both LNW170 circuit packs.

4 **Important!** No provisioned Link Aggregation Groups can exist on the installed working LNW170 100/1G FXS circuit pack.

From the System View, select **View** → **Data** → **LA Group**, select (highlight) the required LNW170 100/1G FXS circuit pack, then click **Select**. Verify that no Link Aggregation Groups exist on the circuit pack.

If required, select **Configuration** → **Data** → **Create/Modify/Delete LA Group** to delete any Link Aggregation Groups on the required LNW170 100/1G FXS circuit pack.

Reference: Procedure 11-46: "Create/Modify/Delete link aggregation group (LAG)" (p. 11-343)

5 Install an LNW170 in the companion slot.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 From the System View, select **Configuration** → **Equipment**, select the newly inserted LNW170 100/1G FXS circuit pack, then click **Select**. Provision the VLAN Tagging Mode to **SWITCHED**, Ethernet Cross Connect Mode, Transmission Audit, and Port Configuration port rates the same as the companion circuit pack. Provision other parameters as required.

If required, select the working LNW170 100/1G FXS circuit pack, then click **Select**. View the existing **Port Configuration** and **Ethernet Cross Connect Mode** parameter settings to be used.

7



NOTICE

Service-disruption hazard

Changing the Slot Protection State of the LNW170 100/1G FXS circuit pack causes a circuit pack reset which may take up to several minutes to complete and disrupt service.

Wait until the circuit pack reset is complete before performing additional provisioning.

From the System View, select **Configuration** → **Equipment**, select the original working LNW170 100/1G FXS circuit pack, then click **Select**. Provision the **Slot Protection State** to **PROT**.

Result:

- The services and L2 provisioning on the working circuit pack ports 1, 2, 5, and 6 are transferred to LAG groups 1, 2, 3, and 4, respectively.
- The same port numbers on the companion slot are members of those LAG's.
- Any ports not in use on the working circuit pack remain so but are members of their preassigned LAG's.
- A protection group is created and the working circuit pack **Switch State** becomes `Active-WAN`.

Reference: Procedure 4-14: "Provision Ethernet circuit pack/LAN port/VCG for service" (p. 4-73)

8 Select **View** → **Equipment** to access the affected circuit packs and verify that the Slot Protection State changed to Protected.

9 If required, use the TL1 **ed-eport** command to provision the LAG member LAN ports and LAG port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, select the LAG group or expand the details for the LAG group, highlight the member LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

10 If required, use the TL1 **`ent-erate`** command to provision the LAG related QoS parameters, or select **Configuration** → **Data** → **Provision QoS Service** from the System View menu. Expand the details for the circuit pack, highlight the LAG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248)

11 If required, use the TL1 **`ed-lagrp`** command to modify the LAG, or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select (highlight) the circuit pack, then click **Select**.

Modifying a LAG consists of changing the hashtype, or changing the protocol parameter.

- **Hash Type**
  The basis for assigning a conversation to a link.
  . Valid values are:
  - MAC - Use Source Address/Destination Address (SA/DA) (initial value)
  - IP - Use Source IP Address/Destination IP Address (SIP/DIP). This may allow better load distribution when connected to a router where the MAC SA/DA are constant or nearly constant and the traffic is IP.
- **Protocol**.
  The protocol used for Link Aggregation.
  Valid values:
  - LACP - IEEE Std 802.3™-2002 Link Aggregation Control Protocol (initial value).
  - NONE - Aggregation among members is forced. Any Link Aggregation protocol messages received are ignored and none are sent.

12 Click twice in the **Hash Type** or **Protocol** box. Select the Hash Type or Protocol value, as required. Click **Apply**, read the warning message then click **Yes** to execute the command. Click **Close** to exit.

13 As required, complete other L2 provisioning (for example, virtual switch, vlan, spanning tree groups, cross-connections) using the procedures in this chapter.

14 A default port tag (Virtual LAN tagging mode Transparent) or default VLAN (Virtual LAN tagging mode 802.1 Tag) must be provisioned for the LAG group in order to pass any untagged frames.

Perform one of the following as required:

- Virtual LAN tagging mode — 802.1 Tag: Use the TL1 **`ent-vlan`** command or **Configuration** → **Data** → **Create VLAN** command from the System View menu to create the default VLAN for untagged traffic for the selected LAG group.
- Virtual LAN tagging mode — Transparent: Use the TL1 **`ed-eport`** command or **Configuration** → **Data** → **Create Port Tag** command from the System View menu to create the default Port Tag for untagged traffic for the selected LAG group.

END OF STEPS

Procedure 11-46.5: Create LAG, one slot already equipped with LNW170 circuit pack with non-VLF Mains

Overview

This procedure assumes that an existing "working" unprotected LNW170 circuit pack is already installed in the shelf with non-VLF mains and you want to establish protected LNW170 LAG groups. It is assumed the existing LNW170 VLAN Tagging Mode is provisioned as SWITCHED and in service.

Steps

Complete the following steps to change the Slot Protection State from Unprotected to Protected for a Function/Growth group equipped with an LNW170 100/1G FXS circuit pack:

1 **Important!** All virtual switches and cross-connections must be removed from ports 3, 4, 7 and 8 on the installed "working" circuit pack. If service is being provided on those ports, the service must be moved/removed before continuing with this procedure.

If required, use the **Configuration** → **Data** → **Delete Virtual Switch** and/or **Configuration** → **Cross-Connections** command to delete the required virtual switches or cross-connections on ports 3, 4, 7 and 8.

2 **Important!** Any PTMs installed in ports 3, 4, 7, or 8 must be removed.

Remove any PTM's from ports 3, 4, 7, or 8 on both LNW170 circuit packs.

3 **Important!** No provisioned Link Aggregation Groups can exist on the installed working LNW170 100/1G FXS circuit pack.

From the System View, select **View** → **Data** → **LA Group**, select (highlight) the working LNW170 100/1G FXS circuit pack, then click **Select**. Verify that no Link Aggregation Groups exist on the circuit pack.

If required, select **Configuration** → **Data** → **Create/Modify/Delete LA Group** to delete any Link Aggregation Groups on the working LNW170 100/1G FXS circuit pack.

Reference: Procedure 11-46: "Create/Modify/Delete link aggregation group (LAG)" (p. 11-343)

4 

NOTICE

Service-disruption hazard

Changing the Slot Protection State of the LNW170 100/1G FXS circuit pack causes a circuit pack reset which may take up to several minutes to complete and disrupt service.

Wait until the circuit pack reset is complete before performing additional provisioning.

From the System View, select **Configuration** → **Equipment**, select the working LNW170 100/1G FXS circuit pack, then click **Select**. Provision the **Slot Protection State** to **PROT**.

Result: The VLAN Tagging Mode on the unequipped companion slot becomes SWITCHED. The Ethernet Cross Connect Mode, Transmission Audit, Port Configuration, and VCG parameters become the same as on the equipped slot.

- The services and L2 provisioning on working circuit pack ports 1, 2, 5, and 6 are transferred to LAG groups 1, 2, 3, and 4, respectively.
- The same port numbers on the companion slot are members of those LAG's.
- Any ports not in use on the working circuit pack remain so but are members of their preassigned LAG's.
- A protection group is created and the **Switch State** of the working circuit pack addressed by the Configuration Equipment command (ed-eqpt) becomes `Active-WAN`.

5 Install an LNW170 in the unequipped companion slot.

Reference: Procedure 4-13: "Install Gigabit Ethernet circuit packs" (p. 4-66)

6 Select **View** → **Equipment** to access the affected circuit packs and verify that the Slot Protection State changed to Protected.

7 If required, use the TL1 **ed-eport** command to provision the LAG member LAN ports and LAG port parameters, or select **Configuration** → **Equipment** from the System View menu. Expand the details for the circuit pack, select the LAG group or expand the details for the LAG group, highlight the member LAN port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-11: "Provision Ethernet LAN port parameters" (p. 11-70)

8 If required, use the TL1 **`ent-erate`** command to provision the LAG related QoS parameters, or select **Configuration** → **Data** → **Provision QoS Service** from the System View menu. Expand the details for the circuit pack, highlight the LAG port, then click **Select**. Provision the parameters as required.

Reference: Procedure 11-31: "Provision Ethernet quality of service (QoS) - LNW70/LNW170" (p. 11-248)

9 If required, use the TL1 **`ed-lagrp`** command to modify the LAG, or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select (highlight) the circuit pack, then click **Select**.

Modifying a LAG consists of changing the hashtype, or changing the protocol parameter.

- **Hash Type**
  The basis for assigning a conversation to a link.
  . Valid values are:
  - MAC - Use Source Address/Destination Address (SA/DA) (initial value)
  - IP - Use Source IP Address/Destination IP Address (SIP/DIP). This may allow better load distribution when connected to a router where the MAC SA/DA are constant or nearly constant and the traffic is IP.
- **Protocol**.
  The protocol used for Link Aggregation.
  Valid values:
  - LACP - IEEE Std 802.3™-2002 Link Aggregation Control Protocol (initial value).
  - NONE - Aggregation among members is forced. Any Link Aggregation protocol messages received are ignored and none are sent.

10 Click twice in the **Hash Type** or **Protocol** box. Select the Hash Type or Protocol value, as required. Click **Apply**, read the warning message then click **Yes** to execute the command. Click **Close** to exit.

11 As required, complete other L2 provisioning (for example, virtual switch, vlan, spanning tree groups, cross-connections) using the procedures in this chapter.

12 A default port tag (Virtual LAN tagging mode Transparent) or default VLAN (Virtual LAN tagging mode 802.1 Tag) must be provisioned for the LAG group in order to pass any untagged frames.

Perform one of the following as required:

- Virtual LAN tagging mode — 802.1 Tag: Use the TL1 **`ent-vlan`** command or **Configuration** → **Data** → **Create VLAN** command from the System View menu to create the default VLAN for untagged traffic for the selected LAG group.
- Virtual LAN tagging mode — Transparent: Use the TL1 **`ed-eport`** command or **Configuration** → **Data** → **Create Port Tag** command from the System View menu to create the default Port Tag for untagged traffic for the selected LAG group.

END OF STEPS

Procedure 11-46.6: Delete LAG on LNW170 (change protected to unprotected)

Overview

This procedure assumes that existing LNW170 circuit packs are installed in the shelf with a Slot Protection State of PROT (protected) and you want to change the Slot Protection State to UNPROT (unprotected) and delete the LNW170 LAG groups.

Important! The command to change the Slot Protection State to UNPROT may be addressed to either slot of the Function/Growth group. The slot addressed will retain all its provisioned values and inherit the now unprotected cross-connections and virtual switches. Layer 2 parameters of each LAG will transfer to their member ports.

The following results when the Slot Protection State is changed back to UNPROT:

- Both slots remain provisioned for LNW170 circuit packs, even if one slot was originally unequipped when the Slot Protection State was provisioned to PROT.
- The LAGs and protection group are removed.
- Values of VLAN Tagging Mode, Ethernet Cross Connect Mode, Port Configuration and all VCG parameters remain the same for the slot addressed by the command to change the Slot Protection State to UNPROT, unless the values are specifically changed with the same command.
- The slot addressed will retain all its provisioned values and inherit the now unprotected cross-connections and virtual switches. Layer 2 parameters of each LAG will transfer to their member ports.
- The values of all provisionable parameters for the slot *not* addressed by the command are changed to their default values.
- If the command addresses slot 2, change messages are issued for deleting the cross-connections on the slot 1 AID and for creating the cross-connections on the slot 2 AID. These cross-connections are now reported only against slot 2. The change messages are issued because of the change of slot on which the cross-connections are reported. Since the cross-connections are not actually deleted and re-created, transmission hits do not occur. If the command addresses slot 1, there are no changes to cross-connectionions.

- For shelves with non-VLF Mains:
  - If an LNW170 has *not* been inserted into the unequipped slot, when the Slot Protection State is changed to UNPROT, the unequipped slot reverts back to its normal non-VLF MAIN unequipped state in which any circuit pack inserted into the slot will cause an "CP not allowed-eqpt" alarm to be issued.
  - If an LNW170 has been inserted into the unequipped slot, when the Slot Protection State is changed to UNPROT, the slot *not* addressed by the command reverts back to its normal non-VLF MAIN unequipped state in which any circuit pack inserted into the slot will cause an "CP not allowed-eqpt" alarm to be issued. If the LNW170 in the slot not addressed by aid has not been removed, the "CP not allowed-eqpt" alarm is issued at the completion of the ED-EQPT command.

Steps

Complete the following steps to change the Slot Protection State from Protected to Unprotected for a Function/Growth group equipped with LNW170 100/1G FXS circuit pack(s):

1



NOTICE

Service-disruption hazard

Changing the Slot Protection State of the LNW170 100/1G FXS circuit pack causes a circuit pack reset which may take up to several minutes to complete and disrupt service.

Wait until the circuit pack reset is complete before performing additional provisioning.

Use the TL1 **`ed-eqpt`** command to change the Slot Protection State to UNPROT (prot_state=UNPROT), or select **Configuration** → **Equipment** from the System View, select (highlight) the required LNW170 100/1G FXS circuit pack, then click **Select**. Provision the **Slot Protection State** to **`UNPROT`**.

Result: If the Main slots are equipped with VLF OLIU circuit packs, the LNW170 100/1G FXS circuit packs are unprotected and the corresponding ports on the companion circuit packs operate independently.

If the Main slots are equipped with non-VLF OLIU circuit packs, the LNW170 100/1G FXS circuit pack in the addressed slot is unprotected and any circuit pack in the companion slot is alarmed (`CP not allowed - eqpt`).

See the Overview section of this task for additional results.

Reference: Procedure 4-14: “Provision Ethernet circuit pack/LAN port/VCG for service” (p. 4-73)

2 **Important!** Both slots remain provisioned for LNW170 circuit packs, even if one slot was originally unequipped when the Slot Protection State was provisioned to PROT.

If the Main slots are equipped with non-VLF OLIU circuit packs and the system is reporting a `CP not allowed - eqpt` alarm for the companion LNW170 100/1G FXS circuit pack, remove the affected circuit pack from the Function/Growth group according to local procedures and select **Configuration** → **Update System** → **Update All**.

If the Main slots are equipped with VLF OLIU circuit packs and you want to change the expected circuit pack type in the slot that was *not* addressed by the command, remove the affected circuit pack from the Function/Growth group according to local procedures and select **Configuration** → **Update System** → **Update All**.

END OF STEPS

Procedure 11-47: Enable/Disable transmission audit

Overview

Use this procedure to enable or disable transmission audit on the LNW70/LNW170 circuit packs.

The transmission audit is a consistency check between counters on various devices on the LNW70/LNW170 circuit pack. The transmission audit feature provides error detection capabilities that might not otherwise be detected.

When enabled, a transmission audit failure will result in a LAN or VCG segment audit failed alarm (SEGAUDTIN or SEGAUDTOUT) or equipment NP audit failed alarm (NPAUDT). When transmission audit is disabled, any outstanding NPAUDT and SEGAUDTIN/SEGAUDTOUT alarms clear.

When transmission audit is enabled for a circuit pack that is part of a pair of protected circuit packs (LNW170 only), transmission audit is enabled for both circuit packs of the pair.

Privilege level

You must login at least as a General or Privileged user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 11-4) and "Required equipment" (p. 11-4) in this chapter and you must have complete work instructions for this procedure that detail the shelf slots and circuit packs that are being enabled/disabled.

Steps

Use the following procedure to enable/disable transmission audit.

1 Use the *WaveStar*® CIT to log in to the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Select **Configuration** → **Equipment** from the System View menu. Select the circuit pack, then click **Select**.

3 For **Transmission audit**, select **ENABLED** (default value) to enable transmission audit. Select **DISABLED** to disable transmission audit. Click **Apply**, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

END OF STEPS

Procedure 11-48: Provision Ethernet ring protection (ERP)

Overview

Use this procedure to configure Ethernet ring protection (ERP).

The procedures in this section cover the following:

- Configuring a new Ethernet ring protection (ERP) ring.
- Adding a node to an Ethernet ring protection (ERP) ring.
- Deleting a node from an Ethernet ring protection (ERP) ring.
- Moving an RPL/RPL Owner node.
- Transitioning LNW170 in UNPROT mode to PROT.
- Transitioning LNW170 in PROT mode to UNPROT.

Ethernet ring protection provides switching for LNW70/170 Ethernet links connected in a ring configuration.

Figure 11-67, "Ethernet ring protection" (p. 11-380) shows a four-node ring. One of the links on Node 4 has been provisioned to be the Ring Protection Link (RPL). This is the link that by default is blocked for normal traffic. Node 4 is therefore the RPL Owner and blocks traffic bidirectionally. Switching is revertive – when a failure clears in the ring, the RPL is blocked (after a wait-to-restore delay). The ring has a VLAN dedicated to APS signaling, called the R-APS channel.

The LNW70 circuit pack supports switched and private line applications. The LNW170 offers all the features on the LNW70. In addition, the LNW170 can be equipped in pairs in an equipment protection configuration. There are 4 FE and 4 GbE LAN ports available on the LNW70/170. Up to 32 VCGs can be supported on the circuit pack. ERP is supported in protected and unprotected mode but only for switched applications.

Links supporting ERP are not required to all be the same rate; the ring can contain a mix of FE and GbE ports, or it can contain a mix of VCGs with different bandwidths, or a mix of FE/GbE ports and VCGs. It is up to the user/network designer to make sure that the ERP ring is appropriately sized for the application.

The following are some considerations for ERP support on LNW70/170:

- ERP is supported on optical and electrical SFP-based LAN ports on the LNW70/170, as well as the VCGs.

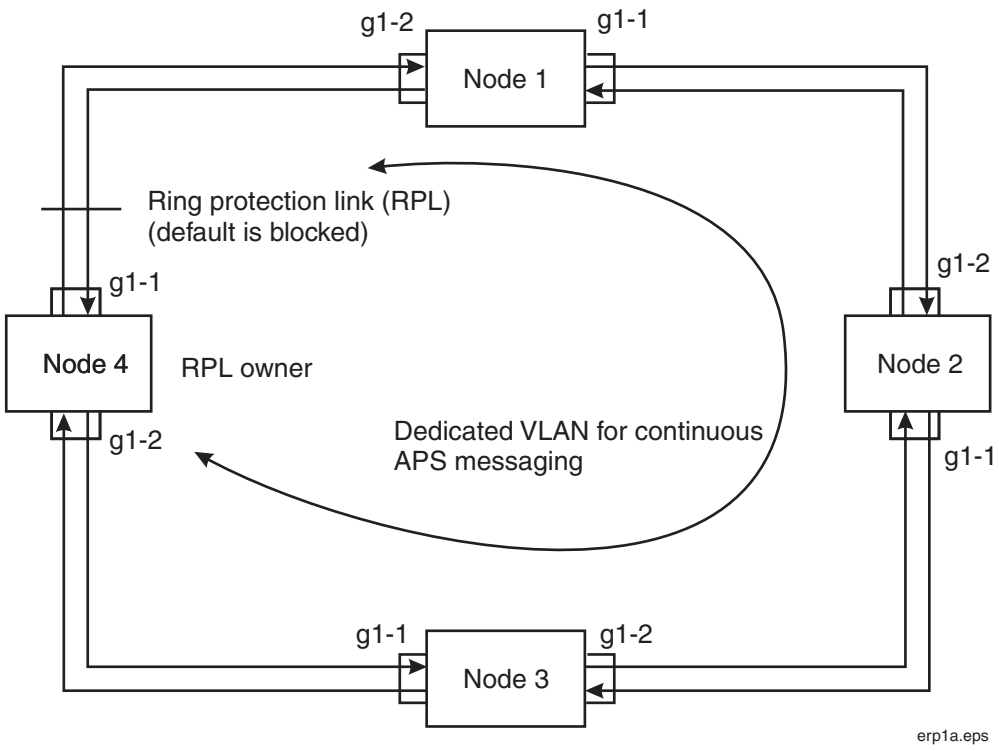
  Note that protection switch times are 50 msec. Detection times have been optimized for optical ports only.
- LNW70/170 vlantagmd must be set to SWITCHED.
- LCAS protection should be disabled on VCGs that are ERP-controlled by keeping the LCAS **Hold-off Timer** set to **99999** (Infinity).

- When the companion slots are equipped with LNW170, the ports on two circuit packs may be working independently when the circuit pack slot protection state is provisioned as UNPROT, or paired LAN ports 1, 2, 5 and 6 may be in a equipment protection mode when provisioned as PROT. Ports 3, 4, 7 and 8 cannot be used.
- In equipment-unprotected mode (Slot Protection State = UNPROT), the following is supported:
  - LAN-based ERP across any 2 ports.
    See Figure 11-68, “ERP on LNW70/170 unprotected LAN ports” (p. 11-381).
  - VCG-based ERP across any 2 VCGs.
    See Figure 11-69, “ERP on LNW70/170 unprotected VCG ports” (p. 11-381).
  - A combined LAN-and-VCG-based ERP.
- In equipment-protected mode (Slot Protection State = PROT), the following is supported:
  - VCG-based ERP across any 2 pair of equipment-protected VCGs is supported.
    See Figure 11-70, “ERP on LNW170 protected VCG ports” (p. 11-382).
- UNPROT to PROT transitions are not allowed if there are any LAN-based ERPs, but are allowed with VCG-based ERPs
- Four LAN ERP instances per UNPROT circuit pack is supported. In addition to the LAN port, ERP on VCG ports is also supported. For a protected LNW170 in DMX/DMXtend, up to 16 ERP instances is supported on VCGs.

  For an unprotected LNW70/170 in DMX/DMXtend up to 20 ERP instances (main or sub-ring) is supported (on VCGs and/or Ethernet ports).

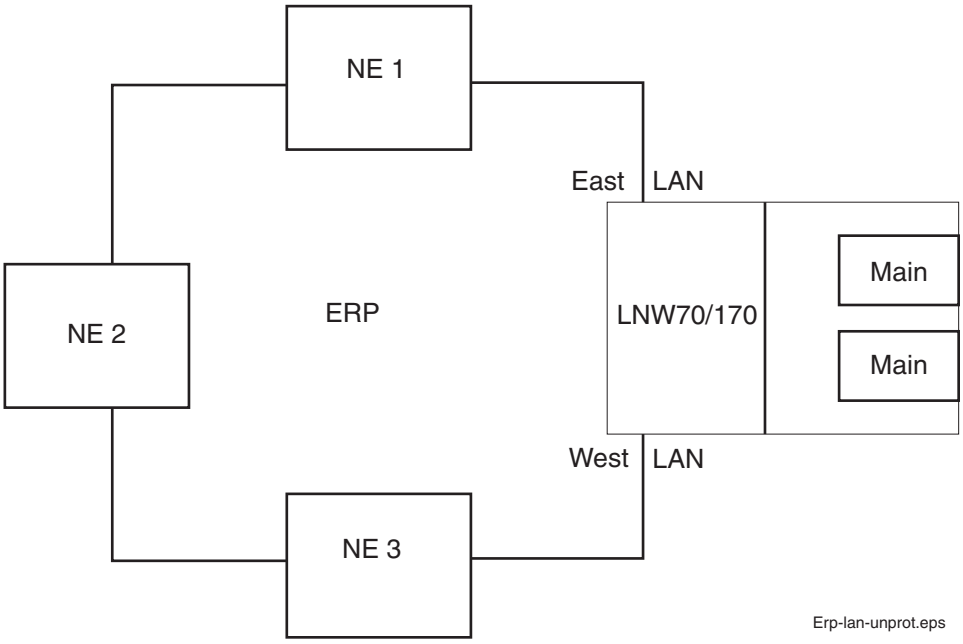
ERP

Figure 11-67 Ethernet ring protection



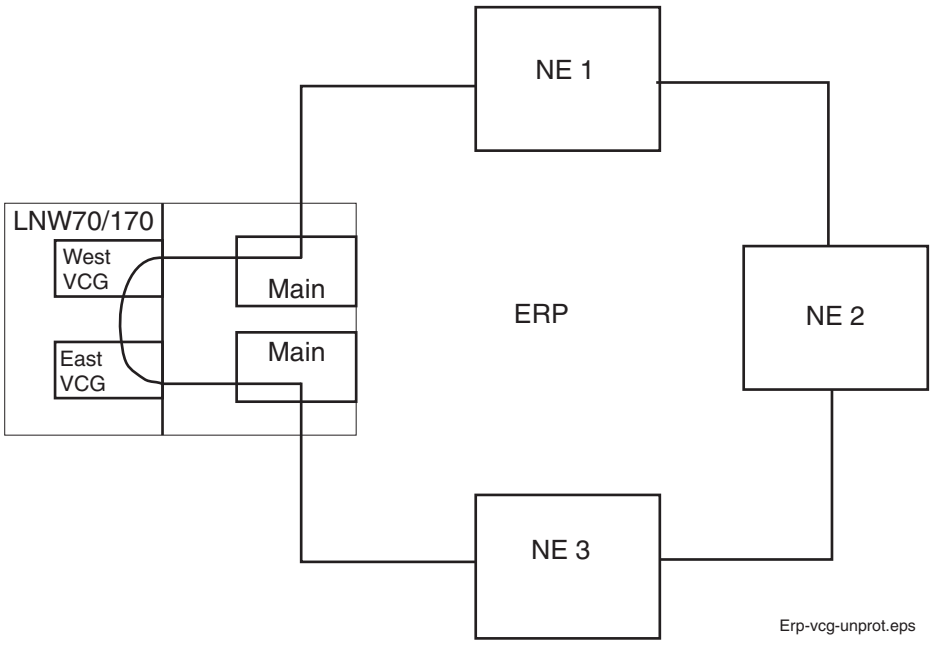
ERP on LAN ports (UNPROT)

Figure 11-68 ERP on LNW70/170 unprotected LAN ports



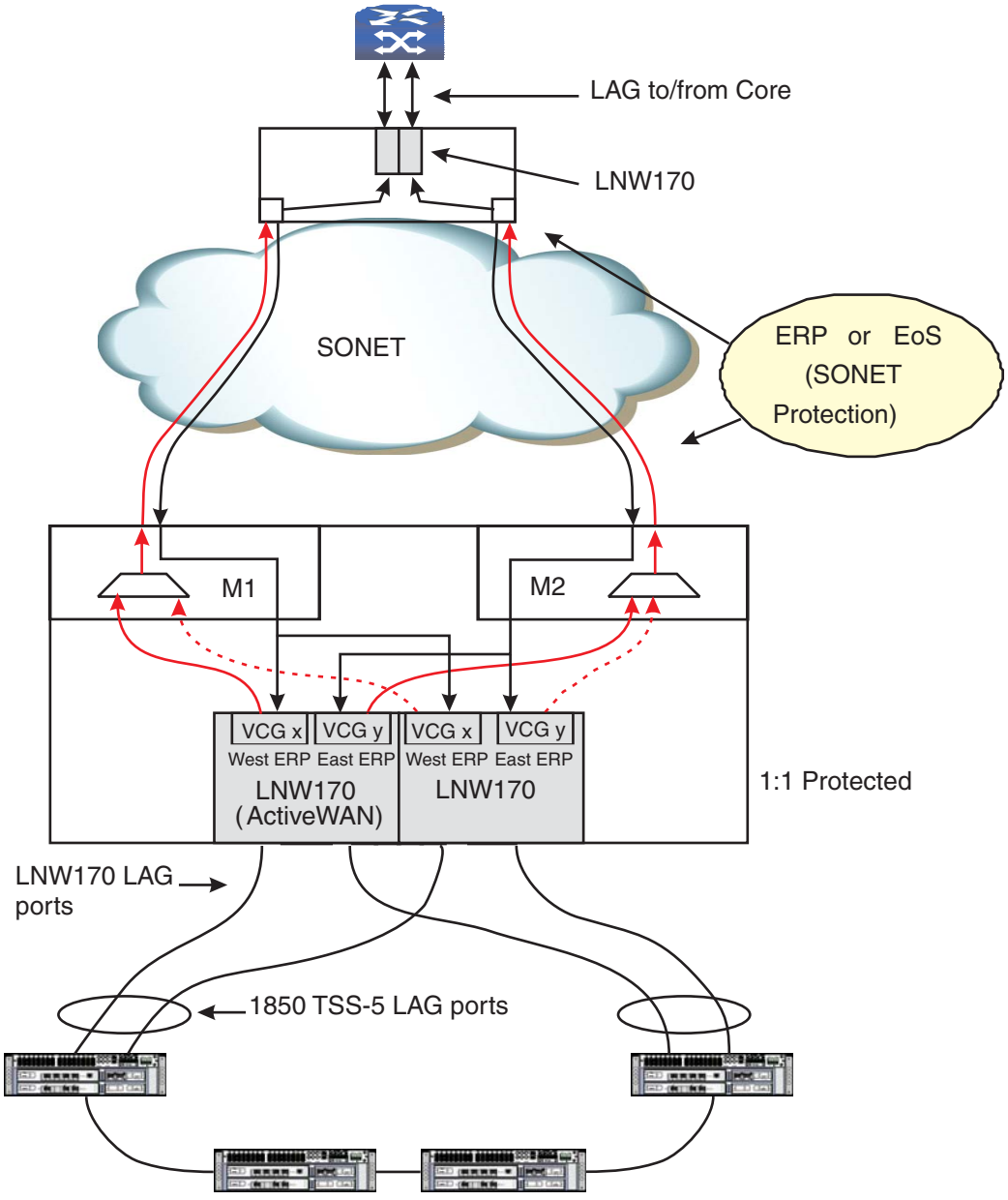
ERP on VCG ports (UNPROT)

Figure 11-69 ERP on LNW70/170 unprotected VCG ports



ERP on LNW170 VCG ports (PROT)

Figure 11-70 ERP on LNW170 protected VCG ports



Dual Ring Interconnection - G.8032v1 Amendment 1

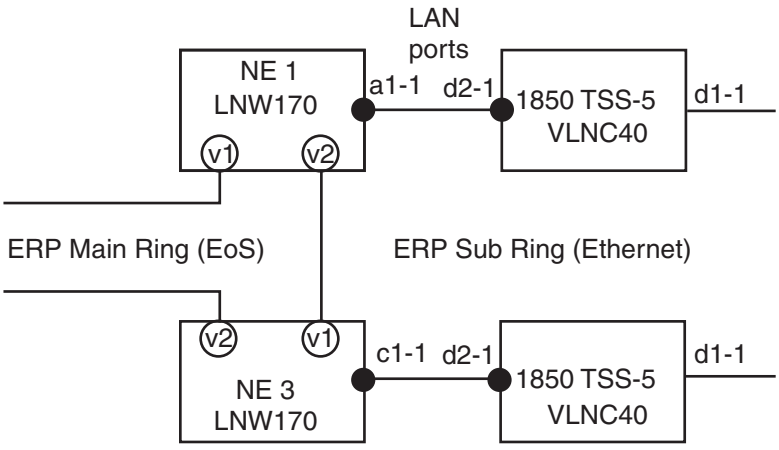
In dual ring interconnection (DRI), two ERP rings "share" a segment. In its simplest form a segment is composed of two interconnection nodes (ICN) and a shared link. For example, see Figure 11-71, "Basic DRI with ERP" (p. 11-383). Only one of the rings

takes responsibility for protecting the shared link. This is the “Main” ring. The other ring is called “Sub” ring. The Main ring is responsible for tunneling the R-APS PDUs of the sub-ring. This is called the R-APS virtual channel.

The Main ring and its sub-ring use different R-APS VLANs. The R-APS VLAN of the sub ring is considered regular data traffic for the Main ring (and is protected as such). Only ICN nodes need to be DRI-aware. A node is an ICN node if it has a sub-ring terminating on a main ring. Other (non-ICN) nodes simply run the single-ring ERP (and in fact don’t know if they belong to a main ring or sub ring).

The two rings work independently, the main ring controlling the shared segment. They each have an RPL. A protection switch in the Main ring does not affect the sub-ring because the sub ring should still be able to hand off traffic to the Main ring via either of the interconnection nodes. This is also true if the shared link fails.

Figure 11-71 Basic DRI with ERP



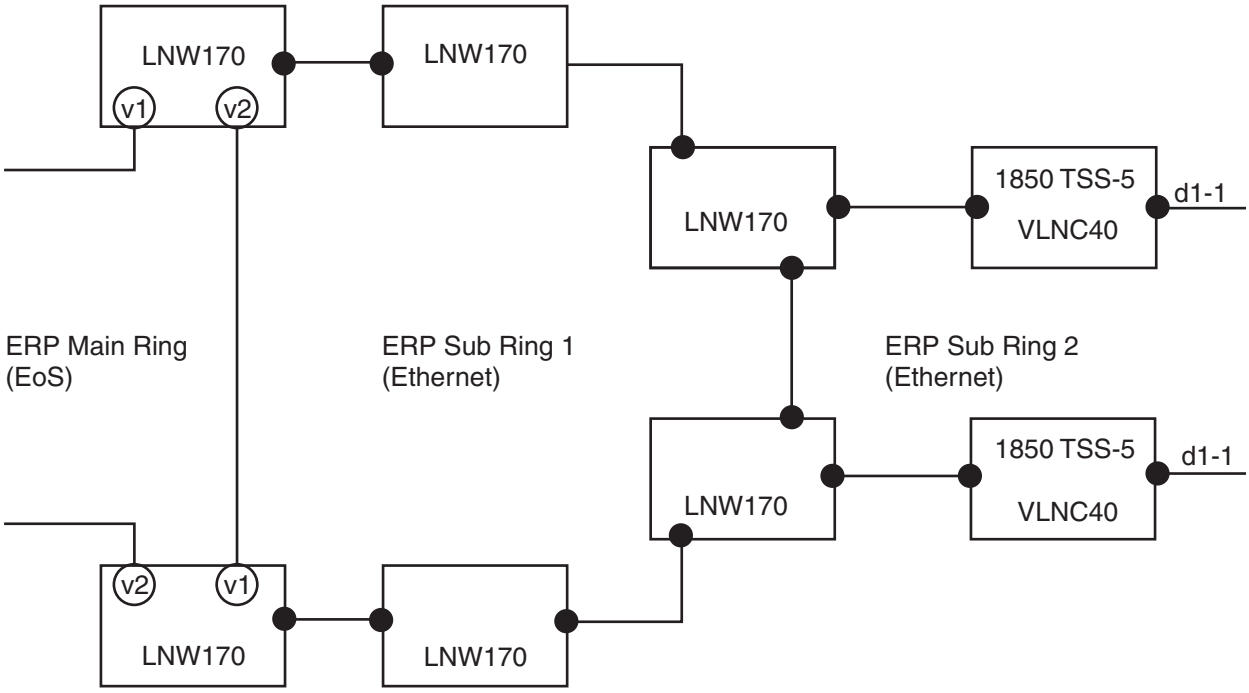
1850 TSS-5 = Alcatel-Lucent 1850 Transport Service Switch 5

Erp-dri.eps

Rings can be cascaded into a ladder configuration. A sub-ring assumes the role of main ring for another sub-ring. See Figure 11-72, “ERP DRI ladder example” (p. 11-384).

Rings may be multi-ring. Two (or more) sub-rings are connected to the same Main ring over the same shared link. See Figure 11-73, “ERP DRI multi-ring example” (p. 11-385).

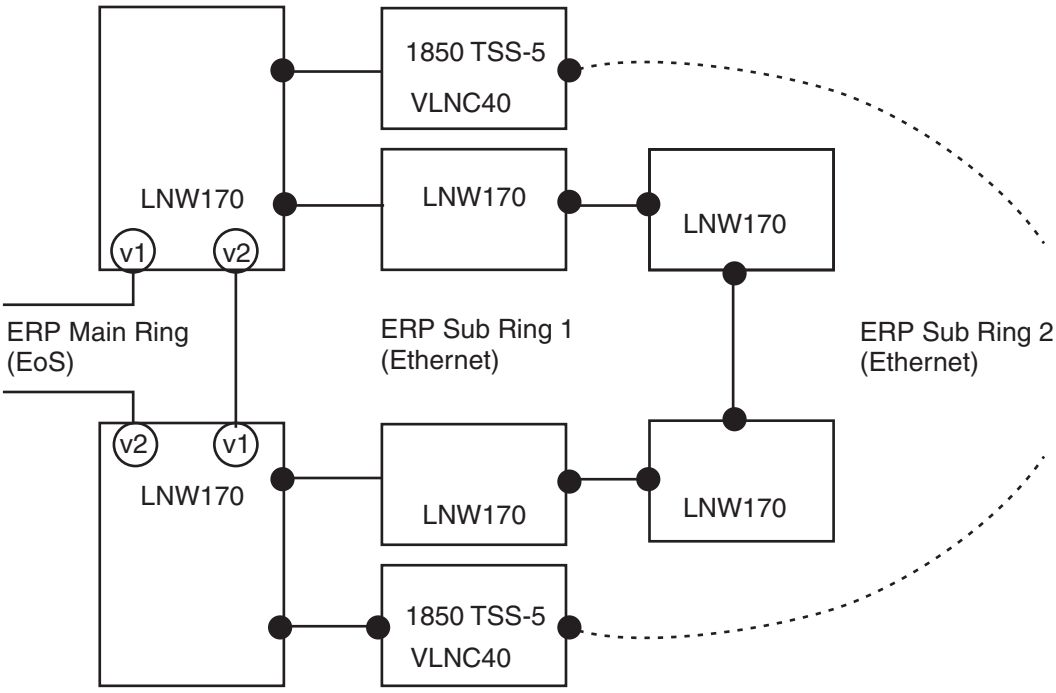
Figure 11-72 ERP DRI ladder example



1850 TSS-5 = Alcatel-Lucent 1850 Transport Service Switch 5

Erp-dri-ladder.eps

Figure 11-73 ERP DRI multi-ring example



1850 TSS-5 = Alcatel-Lucent 1850 Transport Service Switch 5

Erp-dri-multi-ring.eps

ERP parameters

Table 11-16 ERP configuration parameters (ent-erp)

CIT Parameter	Description	TL1 ent-erp command parameter
ERP ID	An alphanumeric string of up to 32 characters. It may not contain a hyphen (“-”). The ERP ID must be unique per slot. The ERP ID has no network-wide significance.There is no requirement that the same ERP ID must be provisioned on the port(s) at the remote network element(s) to which the port(s) at this network element are connected.	erpid
Virtual Switch ID	Virtual Switch ID. Value: An integer in the range 1 to 16.	vrtswid

Table 11-16 ERP configuration parameters (ent-erp) (continued)

CIT Parameter	Description	TL1 ent-erp command parameter
Port 1	Port #1 of the ERP port list. This is a required parameter. The erpport value is an ampersand-separated list of 2 port AIDs, Port 1 and Port 2. Ports: • Port 1 can be an Ethernet or VCG port. • Port cannot be an Ethernet port if the circuit pack is in Protected mode. • Port 1 and Port 2 must have the same Port Role (either CUSTOMER or NETWORK). • The port cannot have the CUSTOMER port role and belong to a virtual switch with Virtual LAN Tagging Mode (tagmd) of Transparent. • Port 1 and Port 2 must be in the same virtual switch specified above. • The port cannot be part of a spanning tree, or LAG, or another ERP instance.	ERPport
Port 2	Port 2 of the ERP port list. This is a required parameter. See the requirement for Port 1 above. Port 2 can also be an ERP ID or Ethernet or VCG port. In case of a sub-ring ERP, this refers to the Main ERP that this sub-ring is connected to.	ERPport
VLAN ID	VLAN ID used for ERP signaling. The VLAN ID cannot be used in the VLAN or Port Tag for the VLAN management. This is a required parameter. Valid values are: an integer in the range 1-4093. The vlan must be unique among all sub-rings attached to the same main ring.	vlan
RPL ID	Ring Protection Link ID. It is either Port 1 or Port 2. A ring requires one (and only one) RPL. This parameter is optional. Note that the user can add or delete the RPL from the ERP. The TL1 command/parameters to use is ED-ERP:addprotlink/delprotlink.	
Wait to Restore	Wait-to-Restore timer. Valid values: an integer in the range of 1-12 minutes. The default value is 5 min. The parameter applies if the RPL ID (see above) is provisioned.	wtr
Guard Timer	Guard timer. Valid values: an integer in the range 10-2000 milliseconds in steps of 10 msec. Default is 500 msec. Prevents nodes from reacting to outdated information.	guard

Table 11-16 ERP configuration parameters (ent-erp) (continued)

CIT Parameter	Description	TL1 ent-erp command parameter
MD Level	Maintenance Domain level. Valid values: an integer in the range 0-7. The default value is 1. It is the service OAM maintenance domain level used in the ERP signaling control messages (R-APS).	mdlevel
Propagation TC Message	Controls enabling propagation of Topology Change (TC) messages. Valid values : Enable or Disable. The default value is Disable. Only applies to sub-ring ERP instances where the sub-ring interconnects with its Main ring and controls whether a sub-ring topology change results in a TC message in the main ring.	proptc
ERP State	Controls enabling the ERP instance. Valid values : Enable or Disable. The default value is Enable. When an ERP instance is disabled, it no longer participates in ERP signaling. Port block/unblock states remain unchanged and ERP messages are still forwarded (unless one of the ports is blocked).	state
R-APS PDU Priority	R-APS PDU priority. Represents the encoding of the p-bits in the R-APS VLAN tag. Valid values: an integer in the range of 0-7. The default value is 7. In order for the p-bits to traverse the ERP ports, the ERP port must have a porttype of BOUNDARY.	pri

Step

1 Perform the following as required:

- Procedure 11-48.1: “Configure new Ethernet ring protection (ERP) ring” (p. 11-388).
- Procedure 11-48.2: “Add node to Ethernet ring protection (ERP) ring” (p. 11-391).
- Procedure 11-48.3: “Move RPL/RPL Owner node” (p. 11-394).
- Procedure 11-48.4: “Delete node from Ethernet ring protection (ERP) ring” (p. 11-396).
- Procedure 11-48.5: “Transition LNW170 in UNPROT mode to PROT” (p. 11-398)
- Procedure 11-48.6: “Transition LNW170 in PROT mode to UNPROT” (p. 11-402)

END OF STEPS

Procedure 11-48.1: Configure new Ethernet ring protection (ERP) ring

Overview

Use this procedure to configure a new Ethernet protection ring (ERP). See Figure 11-67, "Ethernet ring protection" (p. 11-380).

Before you begin

Prior to performing this procedure:

- Determine the node that will be the RPL Owner.
- Determine the ports associated with the RPL link at the RPL Owner node.
- Determine the ports at each node associated with the ERP.
- Determine a VLAN to be used by the ERP for signaling switching requests (using R-APS PDUs). The VLAN must be a VLAN that is presently unused at every node in the ring. The same VLAN must then be used for the ERP at each node in the ring.
- If required, determine the ERP Maintenance Domain Level (0-7). This command is optional. The ERP Maintenance Level must be the same at every node in the ERP..

Step

1 Login to the node that will be the RPL Owner.

2 From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the LNW70/170 with the port chosen for the ring protection link (RPL).

Result: The **ERP** configuration screen displays.

3 Click the **Add** button, then enter the **ERP ID** and the port IDs (**Port 1** and **Port 2**) associated with the ERP. At this time, select **DISABLE** for the **ERP State**.

The ports must be in the same virtual switch.

The port cannot be part of a spanning tree (the port's spanning tree Port Mode must be disabled), or LAG, or another ERP instance.

Reference: See Table 11-16, "ERP configuration parameters (ent-erp)" (p. 11-385).

4 Click **Apply** to create the ERP and associate the links. Click **Close** to exit.

5 Disable the port (Ethernet port or VCG port) associated with the chosen ring protection link (**RPL ID**).

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port.
  From the **Port Data** tab, set **Port Administration Control** to **DISABLE**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **Disabled** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **All Tributaries, This VCG**.
  Click **Apply**, then click **Close**.

  Note: The RPL link will be enabled later after all the nodes on the ring have been provisioned and linked together.

6 From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the LNW70/170 with the port chosen for the ring protection link (RPL).

Result: The **ERP** configuration screen displays.

7 Designate the port for the Ring Protection Link (RPL) for the ring. This command also makes this node the RPL Owner.

In the **RPL ID** box, enter the port AID for the RPL.

8 Enter the remaining parameters and select **ENABLE** for the **ERP State**. Click **Apply** to make your changes. Click **Close** to exit.

Reference: Table 11-16, “ERP configuration parameters (ent-erp)” (p. 11-385).

9 Login to the next node in the ring and use **Configuration** → **Data** → **Create/Modify/Delete ERP** to provision the ERP and associate the links (ports). Set the **ERP State** to **DISABLE** until the nodes are wired together and the links are working.

1. Click **Apply** to create the ERP and associate the links. Click **Close**.
2. Wire the nodes together.
3. When the links are working, enter **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the circuit pack.
4. Set the **ERP State** to **ENABLE**, enter any remaining parameters, then click **Apply**.

Note: Note that there will not be an **RPL ID** for any of the nodes in the ring except for the RPL Owner provisioned earlier.

10 Repeat Step 9 at each node around the ring until all nodes are configured.

11 Login to the RPL Owner node.

12 Enable the port (Ethernet port or VCG port) associated with the chosen ring protection link (**RPL ID**).

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port.
  From the **Port Data** tab, set **Port Administration Control** to **`ENABLE`**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Enabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

END OF STEPS

Procedure 11-48.2: Add node to Ethernet ring protection (ERP) ring

Overview

Use this procedure to add a new node to an Ethernet protection ring (ERP). See Figure 11-74, "Add node to existing Ethernet ring protection (ERP)" (p. 11-393).

Before you begin

Obtain the following information on the existing ERP using **View** → **Data** → **ERP** command from the System View menu:

- The links associated with the ERP.
- Vlan identifier associated with the existing ERP.
- Guard timer and Maintenance Level values, if required.

Step

1 Login to one of the nodes in the ERP.

2 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

3 Login to the new node being added.

4 From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the LNW70/170 with the ports associated with the ERP.

Result: The **ERP** configuration screen displays.

5 Click the **Add** button, then enter the **ERP ID** and the port IDs (**Port 1** and **Port 2**) associated with the ERP. At this time, select **`DISABLE`** for the **ERP State**.

Enter the remaining parameters as required.

The ports must be in the same virtual switch.

The port cannot be part of a spanning tree (the port's spanning tree Port Mode must be disabled), or LAG, or another ERP instance.

Reference: See Table 11-16, "ERP configuration parameters (ent-erp)" (p. 11-385).

6 Click **Apply** to create the ERP and associate the links. Click **Close** to exit.

7 Login to one of the two nodes adjacent to the link which will be replaced with the addition of the new node.

Shut down the ERP link that will be replaced. From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port.
  From the **Port Data** tab, set **Port Administration Control** to **`DISABLE`**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Disabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

  Result: The node signals SF and unblocks the ring protection link (RPL).

8 Wire the new node into the ring (the other adjacent link should also signal SF until the new link is working). Check that the link that is not shut down is working.

9 Login to the new node being added.

10 Enable the ERP at the new node.

Enter **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the circuit pack.

Set the **ERP State** to **`ENABLE`**, enter any remaining parameters, then click **Apply**.

11 Login to the adjacent node where you disabled the link in Step 7.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port that was disabled.

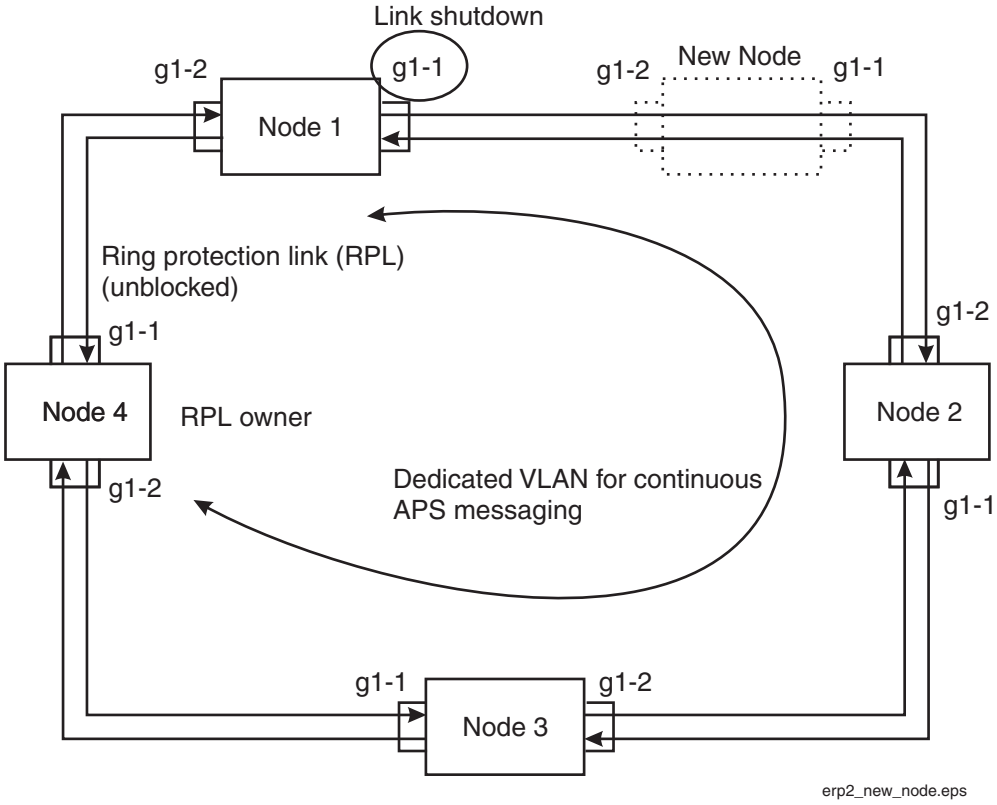
From the **Port Data** tab, set **Port Administration Control** to **`ENABLE`**, then click **Apply**. Click **Close**.

- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Enabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

12 Verify that the link is working.

END OF STEPS

Figure 11-74 Add node to existing Ethernet ring protection (ERP)



Procedure 11-48.3: Move RPL/RPL Owner node

Overview

Use this procedure to move a RPL/RPL Owner to another node.

Step

1 Login to one of the nodes in the ERP.

2 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

3 Login to the node with the link that will be the new RPL.

Shut down the ERP link that will be the new RPL. From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port.
  From the **Port Data** tab, set **Port Administration Control** to **`DISABLE`**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Disabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

  Result: The node signals SF and unblocks the ring protection link (RPL).

4 Login to the existing RPL Owner node.

5 From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the LNW70/170 with the ports associated with the ERP.

Result: The **ERP** configuration screen displays.

6 Make the existing RPL port not be the RPL.

In the **RPL ID** drop-down box, remove the port AID. Click **Apply**, then click **Close**.

7 Login to the node that is the new RPL Owner.

8 From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**. Select the LNW70/170 with the ports associated with the ERP.

Result: The **ERP** configuration screen displays.

9 Designate the port for the new Ring Protection Link (RPL) for the ring. This command also makes this node the RPL Owner.

In the **RPL ID** drop-down box, enter the port AID for the new RPL.

As required, configure the Wait-to-Restore (WTR) time for the ERP.

The WTR time is the length of time after a failure recovers before the ERP reverts to the default configuration (with the RPL blocked). WTR may only be provisioned at the RPL Owner node. The ITU-T G.8032 standard requires the WTR time to be from 5 to 12 minutes.

Click **Apply**, then click **Close**.

10 Enable the new RPL link.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port that was disabled.
  From the **Port Data** tab, set **Port Administration Control** to **`ENABLE`**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Enabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

END OF STEPS

Procedure 11-48.4: Delete node from Ethernet ring protection (ERP) ring

Overview

Use this procedure to delete a node from an Ethernet protection ring (ERP).

If the node being deleted is the RPL Owner node, you must first move the RPL Owner using the procedures of Procedure 11-48.3: "Move RPL/RPL Owner node" (p. 11-394).

Step

1 Login to one of the nodes in the ERP.

2 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

3 Login to one of the nodes adjacent to the node being removed, shut down the link connected to the node being removed.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port.
  From the **Port Data** tab, set **Port Administration Control** to **`DISABLE`**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Disabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

  Result: This node signals SF and unblocks the ring protection link (RPL).

4 Remove the node and reconnect the ring without that node. The other adjacent node should also signal SF until the new link is working.

5 Login to the node where you disabled the link in Step 3.

6 Enable the link that was shutdown in Step 3.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For an Ethernet (LAN) port, highlight and Select the port that was disabled.
  From the **Port Data** tab, set **Port Administration Control** to **`ENABLE`**, then click **Apply**. Click **Close**.
- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Enabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

END OF STEPS

Procedure 11-48.5: Transition LNW170 in UNPROT mode to PROT

Overview

Use this procedure as an example to transition two unprotected LNW170 circuit packs participating in an existing ERP to protected mode with ERP.

This procedure assumes that two unprotected LNW170s are already installed in the node, participating in ERP, and you are transitioning them to protected LNW170s.

Note that the ERP ring must be a VCG ring to transition to protected LNW170 circuit packs.

Step

1 Login to the node being transitioned.

2 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

3 Login to one of the nodes adjacent to the node being transitioned. Shut down the link connected to the node being transitioned.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Disabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

  Result: This node signals SF.

4 Login to the node with the unprotected LNW170(s) being transitioned.

Disable and Delete the ERP on the unprotected LNW170(s).

1. From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**.
2. From the **Create/Modify/Delete ERP** screen, select **`Disable`** for the **ERP State**.
3. Check the **Delete** box to delete the ERP.
4. Click **Apply**, then click **Close**.

5 DELETE EXISTING LAG

If any LAG groups exist on the unprotected LNW170s, use the TL1 **`dlt-lagrp`** command to modify the LAG , or select **Configuration** → **Data** → **Create/Modify/Delete LA Group** from the System View menu. Select the circuit pack.

Important! All but the last port must have been previously removed from the LAG before you can delete the LAG.

6 Click in the **Delete** box for the LAG being deleted. Click **Apply**, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

7 On the companion LNW170 circuit pack, remove cross connection and virtual switches.

8



NOTICE

Service-disruption hazard

Changing the Slot Protection State of the LNW170 100/1G FXS circuit pack causes a circuit pack reset which may take up to several minutes to complete and disrupt service.

Wait until the circuit pack reset is complete before performing additional provisioning.

Set the **Slot Protection State** to **`PROT`**.

From the System View, select **Configuration** → **Equipment**, select the companion LNW170 100/1G FXS circuit pack, then click **Select**. Verify/set **VLAN Tagging Mode** to **`SWITCHED`**. Provision the **Slot Protection State** to **`PROT`**.

Result:

- The services and L2 provisioning on the working circuit pack ports 1, 2, 5, and 6 are transferred to LAG groups 1, 2, 3, and 4, respectively.
- The same port numbers on the companion slot are members of those LAG's.

- Any ports not in use on the working circuit pack remain so but are members of their preassigned LAG's.
- A protection group is created and the working circuit pack **Switch State** becomes `Active-WAN`.

9 Move/install the SFPs, cables, hairpin VCG cross-connections to connect LAG across the LNW170s. Remove any unused SFPs, if required.

10 Reconfigure ERP on both the LNW170s VCGs to include the newly created link between the two circuit packs.

Set **ERP State** to **`ENABLE`**.

Reference: From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**.

11 If required, from the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete LA Group** and change the **Active/Standby Mode**.

12 Enable the link that was shutdown in Step 3.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Enabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

13 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

14 Use UPD-SYS to clean up any alarms.

END OF STEPS

Procedure 11-48.6: Transition LNW170 in PROT mode to UNPROT

Overview



NOTICE

Service-disruption hazard

Service Disruption

This procedure causes service disruption until all the rearrangements are completed.

Use this procedure to transition an LNW170 in protected mode to unprotected mode for ERP.

This procedure will cause service disruption.

Step

1 Login to the node being transitioned.

2 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

3 Login to one of the two nodes adjacent to the node with the LNW170s. Shut down the link connected to the LNW170s.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

For a VCG port, expand the VCG details.

Set **VCG Membership** to **`Disabled`** for both Input and Output Direction.

In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.

Click **Apply**, then click **Close**.

Result: This node signals SF.

4 Login to the node with the protected LNW170s being transitioned.

Disable the ERP on the protected LNW170s.

1. From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**.
2. From the Create/Modify/Delete ERP screen, select **`Disable`** for the **ERP State**.
3. Click **Apply**, then click **Close**.

5 From the System View, select **View** → **Equipment**. For each of the LNW170 circuit packs, determine which circuit pack has a **Switch State** of **Active WAN**.

6 From the System View, select **Configuration** → **Equipment**.

Select the Active WAN LNW170 circuit pack.

7



NOTICE

Service-disruption hazard

Service Disruption

Transmission is lost at this point in the procedure.

Set the **Slot Protection State** to **`UNPROT`**. Click **Apply**, then click **Close**.

8 Create the link between the two unprotected LNW170s that is needed for connectivity.

The links may be a hairpin VCG cross-connection or external LAN port cables.

9 Move the SFPs and cables to the desired circuit pack to support the required LAG on one of the unprotected LNW170s.

10 Create LAG on the desired circuit pack and change the **Active/Standby Mode** (**`asmode`**) to match the other end if necessary. Transmission can be supported at this point.

Reference: From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete LA Group**.

11 Reconfigure ERP on both the LNW170s to include the newly created link between the two circuit packs.

Set **ERP State** to **`ENABLE`**.

Reference: From the System View menu, select **Configuration** → **Data** → **Create/Modify/Delete ERP**.

12 Enable the link that was shutdown in Step 3.

From the System View, select **Configuration** → **Equipment**. Expand the circuit pack details.

- For a VCG port, expand the VCG details.
  Set **VCG Membership** to **`Enabled`** for both Input and Output Direction.
  In the **Apply To:** drop-down box, select **`All Tributaries, This VCG`**.
  Click **Apply**, then click **Close**.

13 Make sure that the ring is in the idle state.

From the Navigation menu, select **View** → **Data** → **ERP**. Select the circuit pack associated with the ERP.

TL1 command: **`rtrv-erp`**.

In the ERP display, verify that the **ERP Instance State** is `ENRB` (No Request (RPL blocked).

Note the VLAN ID and Maintenance Level.

14 Use UPD-SYS to clean up any alarms.

END OF STEPS

12 Ring and circuit pack upgrade procedures

Overview

Purpose

This chapter includes procedures used to:

- Upgrade rings
- Back out of ring upgrades
- Suspend ring upgrades temporarily
- Upgrade transmission circuit packs at a node
- Upgrade/Replace the SYSCTL circuit pack

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Before you begin

Before you begin

Prior to performing any procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Procedure 12-1: Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node

Overview

Use this procedure to upgrade in-service, the cross connect capacity of the following high-speed OLIU circuit packs at a node in a 1+1/UPSR/BLSR network:

- small fabric LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIUs to large fabric LNW27, LNW29, LNW32, LNW76, or LNW202 OC-48 OLIUs
- small fabric LNW48, LNW50, LNW54, or LNW203 OC-12 OLIUs to Very Large Fabric (VLF) multiport, multirate LNW82 OC3/OC12/OC48 OLIUs
- large fabric LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIUs to Very Large Fabric (VLF) multiport, multirate LNW82 OC3/OC12/OC48 OLIUs
- large fabric LNW56, LNW57, LNW58, LNW502, or LNW555 OC-192 OLIUs to Very Large Fabric (VLF) LNW59 OC-192 OLIUs
- large fabric LNW56, LNW57, LNW58, or LNW502 to Very Large Fabric (VLF) LNW504 multi-rate OC-48/OC-192 OLIUs
- Very Large Fabric (VLF) LNW59 OC-192 OLIU to Very Large Fabric (VLF) LNW504 multi-rate OC-48/OC-192 OLIUs

  Note: To upgrade the small fabric OLIUs (LNW26B, LNW28, LNW77, or LNW121B159B) to the VLF fabric OLIU (multirate LNW82 OC3/OC12/OC48), you must first upgrade to a large fabric OLIUs (LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIUs).

  Important! To upgrade the OC-n bandwidth capacity of UPSR/BLSR networks, refer to the following:

  - Procedure 12-3: “Upgrade OC-3 UPSR to OC-12 UPSR” (p. 12-26)
  - Procedure 12-5: “Upgrade OC-12 UPSR to OC-48 UPSR” (p. 12-81)
  - Procedure 12-8: “Upgrade OC-48 UPSR to OC-192 UPSR” (p. 12-171)
  - Procedure 12-11: “Upgrade OC-48 BLSR to OC-192 BLSR” (p. 12-236)
  - Procedure 12-19: “Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR” (p. 12-395)
  - Procedure 12-22: “Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR” (p. 12-447)

The small fabric LNW26B, LNW28, LNW77, and LNW121B–159B OC-48 OLIU circuit packs can cross-connect VT1.5 signals in up to 6 STS-1 signals or 12 STS-1 signals. If the Normal/Enhanced jumper is in the *Normal* position, the circuit pack can cross-connect

VT1.5 signals in up to 6 STS-1 signals. If the Normal/Enhanced jumper is in the *Enhanced* position, the circuit pack can cross-connect VT1.5 signals in up to 12 STS-1 signals.

The small fabric LNW48, LNW50, LNW54, and LNW203 OC-12 OLIU circuit packs can cross-connect VT1.5 signals in up to 12 STS-1 signals.

The large fabric LNW27, LNW29, LNW32, LNW76, LNW202, and LNW221–259 OC-48 OLIU circuit packs can cross-connect VT1.5 signals in up to 48 STS-1 signals.

The large fabric LNW56, LNW57, LNW58, LNW502, or LNW555 OC-192 OLIU circuit packs can cross-connect VT1.5 signals in up to 48 STS-1 signals.

The Very Large Fabric LNW59 OC-192 OLIU circuit packs can cross-connect VT1.5 signals in up to 192 STS-1 signals.

The Very Large Fabric multirate LNW82 OC3/OC12/OC48 OLIU circuit packs can cross-connect VT1.5 signals in up to 192 STS-1 signals.

The Very Large Fabric multirate LNW504 OC48/OC192 OLIU circuit packs can cross-connect VT1.5 signals in up to 192 STS-1 signals.

Important! This in-service upgrade is intended to be used with only circuit packs carrying service protected traffic.

Important! The Very Large Fabric LNW59 and LNW82 circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The Standard Alcatel-Lucent 1665 DMX Shelf does not support upgrades to Very Large Fabric circuit packs.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Upgrades to multiport circuit packs

When upgrading to a circuit pack with more ports, the cross-connections on the original port are mapped to the same port number on the upgrade circuit pack. The upgrade circuit pack must also be configured with compatible pluggable transmission modules that match the port signal rates on the original circuit pack.

The additional ports on the upgrade circuit pack cannot be used until after the upgrade is completed.

Upgrades and multi-shelf digital cross-connect system (DCS) systems

In multi-shelf DCS systems utilizing a single TID, the OLIU circuit packs in the Main slots of the Main shelf support the cross connect capacity upgrades.

If a shelf is configured as a subshelf of a multi-shelf DCS system utilizing a single TID, any attempt to upgrade the OLIU circuit packs in the Main slots of the subshelf will be denied.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Optical power meter
- Two replacement OLIU circuit packs and pluggable transmission modules (if required)
- The following lightguide buildouts (LBOs) should be available:
  - 5-dB loss LBO (code ABLCS-05.0: comcode 108279381)
  - 10-dB loss LBO (code ABLCS-10.0: comcode 108279431)
  - 15-dB loss LBO (code ABLCS-15.0: comcode 108279480)
- Lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269)

Release 9.1 or later software is required to support the following upgrades

- large fabric LNW56, LNW57, LNW58, or LNW502 to Very Large Fabric (VLF) to LNW504 multi-rate OC-48/OC-192 OLIUs
- LNW59 OC-192 OLIU to Very Large Fabric (VLF) LNW504 multi-rate OC-48/OC-192 OLIUs

Release 9.0 or later software is required to support upgraded from LNW48/50/54/203 OC-12 OLIUs to VLF multiport, multirate LNW82 OC3/OC12/OC48 OLIUs

Release 7.1.1 or later software is required to support the following upgrades:

- LNW56/57/58/502/555 OC-192 OLIUs to VLF LNW59 OC-192 OLIUs.
- LNW27/29/32/76/202 OC-48 OLIUs to VLF multiport, multirate LNW82 OC3/OC12/OC48 OLIUs

Release 7.1.0 or later software is required to support the LNW202 OC-48 OLIU circuit packs.

Release 4.0 or later software is required to support the LNW32 OC-48 OLIU circuit packs.

Release 2.1 or later software is required to support the LNW27, LNW29, LNW76, and LNW221–259 OC-48 OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If upgrading to Very Large Fabric (VLF) multiport, multirate LNW82 OC3/OC12/OC48 OLIU or Very Large Fabric (VLF) LNW59 OC-192 OLIU circuit packs, transmission hits (up to 130 ms) will occur as BLSR traffic is switched and transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If upgrading from a small fabric LNW26B OC-48 OLIU to a large fabric LNW27 OC-48 OLIU, transmission hits (up to 400 ms) will occur as BLSR traffic is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure, and verify that the affected OLIU circuit pack/protection group AIDs are specified.

3. Review the applicable office records and verify that each fiber span is capable of supporting the replacement circuit pack/pluggable transmission module. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the replacement circuit packs/pluggable transmission modules.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.
5. If the provisioned Timing Source is external, verify that both timing references (REF-1 and REF-2) are in-service (IS) before beginning this procedure.
6. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected in a BLSR during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to upgrade in-service, the cross connect capacity of the high-speed OLIU circuit packs at a node in a 1+1/UPSR/BLSR network.

1 Log in to the node where the high-speed OLIU circuit packs are to be replaced.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

2 Using the *WaveStar*® CIT verify the status of the node to be upgraded.

Reference: Procedure 12-1.1: “Verify status of node to be upgraded” (p. 12-14)

3 If required, verify the active/standby status of the high-speed OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-1.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-16)

4 **Important!** The OLIU circuit pack in Main slot **M1** must be replaced first.

Open the lower faceplate latch on the OLIU circuit pack in Main slot **M1**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OLIU circuit pack in Main slot **M1**. Then replace the OLIU circuit pack in Main slot **M1** with the replacement OLIU circuit pack/pluggable transmission module.

Result: Transmission hits (less than 60 ms) may occur if traffic exists on the circuit pack in Main slot **M1**. If through traffic exists (UPSRs and BLSRs only), transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped.

If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement OLIU circuit pack/pluggable transmission module is installed. After the circuit pack firmware update is complete, the system reports an `unexpected CP type` alarm for Main slot **M1**.

If a circuit pack firmware update is not required, the system reports an `unexpected CP type` alarm for Main slot **M1** when the replacement OLIU circuit pack/pluggable transmission module is installed.

If upgrading to VLF OLIU circuit packs, the system reports a `CP removed or CP failure` alarm for approximately 4 minutes before reporting the `unexpected CP type` alarm.

For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for Main slot **M1**.

Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

5 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs/pluggable transmission modules.)

6 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

7 **NOTICE**

Service-disruption hazard

If upgrading to Very Large Fabric (VLF) multiport, multirate LNW82 OC3/OC12/OC48 OLIU or Very Large Fabric (VLF) LNW59 OC-192 OLIU circuit packs, transmission hits (up to 130 ms) will occur as BLSR traffic is switched and transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If upgrading from a small fabric LNW26B OC-48 OLIU to a large fabric LNW27 OC-48 OLIU, transmission hits (up to 400 ms) will occur as BLSR traffic is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** is tested and autoprovisioned,

The system performs automatic protection switches. Transmission hits (less than 60 ms) occur as traffic is automatically switched from the OLIU circuit pack in Main slot **M2** to the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**. All traffic is now active on the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**.

For BLSR protection groups, the `Line Automatic Switch` condition for Main slot **M1** clears, and the system reports a `Line Automatic Switch` condition for Main slot **M2**.

Alarms may also be reported at other nodes in the network.

8 Open the lower faceplate latch on the OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OLIU circuit pack in Main slot **M2**. Then replace the OLIU circuit pack in Main slot **M2** with the replacement OLIU circuit pack/pluggable transmission module.

Result: The replacement OLIU circuit pack/pluggable transmission module in Main slot **M2** is tested and autoprovisioned.

If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement OLIU circuit pack/pluggable transmission module is installed. After the circuit pack firmware update is complete, the `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `inc. LOS` alarm for Main slot **M2**.

If a circuit pack firmware update is not required, the `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `inc. LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

9 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs/pluggable transmission modules.)

10 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OLIU circuit pack/pluggable transmission module in Main slot **M2**.

Result: All alarms clear and service is restored after the provisionable wait-to-restore interval elapses. (The default is 5 minutes.) This applies to the local node and the adjacent node connected to the circuit pack in Main slot **M2**.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

11 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs/pluggable transmission modules. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

12 This completes the circuit pack upgrade at the local node. If other nodes in the network are to be upgraded, repeat this procedure at each node beginning at the adjacent node connected to the circuit pack in Main slot **M2**.

END OF STEPS

Procedure 12-1.1: Verify status of node to be upgraded

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Complete the following steps to verify the status of the node to be upgraded.

1 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

4 **Important!** If the network element is equipped with LNW6 or LNW7 28DS1 circuit packs, attempts to upgrade from non-VLF OLIU circuit packs to VLF OLIU circuit packs are denied.

If upgrading to VLF OLIU circuit packs, select **Reports** → **Equipment Lists**→ **Pack**. Click **Shelf** and **Select** to access the *Circuit Pack List* and verify that the shelf is not equipped with LNW6 or LNW7 28DS1 circuit packs.

If required, replace the LNW6 or LNW7 28DS1 circuit packs.

Reference: Procedure 12-15: “Upgrade low-speed electrical circuit packs” (p. 12-317)

END OF STEPS

Procedure 12-1.2: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **View** → **Protection** to access the required protection group (according to the work instructions) and determine if the circuit pack to be replaced is active for transmission. Record the active paths supported by the circuit pack to be replaced. Click **Close**.

5 **Important!** If the circuit pack to be replaced is active for transmission, optional manual switches can be performed before replacing the circuit pack. In UPSRs, each path supported by the circuit pack to be replaced must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* active for transmission, proceed to Step 6.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**.

If the required port is part of a ...	Then ...
UPSR protection group,	Expand *Path Protection*, select the required path and click **Select**. Select the *Manual* Switch Type and click **Apply**. Repeat this step for each active path supported by the circuit pack to be replaced.
BSLR protection group,	Select the required *2F BLSR* line and click **Select**. Select the Direction for the circuit pack to be replaced (West for Main slot **M1** or East for Main slot **M2**) and *Manual to Protection, Ring* Switch Type, and click **Apply**.
1+1 protection group,	Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

If a UPSR or 1+1 protection group, the system reports a `manual switch` condition for the affected line/path.

If a BLSR protection group, the system reports the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed) for the affected line.

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-2: Back out cross-connect capacity/port density upgrade of high-speed OLIU circuit packs

Overview

Important! Do not use this procedure to downgrade a node if the upgrade has been completed and additional cross-connections have been provisioned (and even subsequently deleted). The system will not recognize the original OLIU circuit pack as an allowable type.

Use this procedure to back out of an in-service cross connect capacity upgrade of high-speed OLIU circuit packs (in progress) at a node in a 1+1/UPSR/BLSR network.

Backing out of an upgrade in progress returns the node to the pre-upgrade state.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OLIU circuit packs and LBOs for the node to be backed out



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If backing out a Very Large Fabric (VLF) multirate LNW82 OC3/OC12/OC48 OLIU or Very Large Fabric (VLF) LNW59 OC-192 OLIU circuit pack upgrade, transmission hits (up to 100 ms) may occur as traffic is switched.

The length of the service hits varies based on shelf equipage and TDM service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.
3. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected in a BLSR during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to back out of an in-service cross connect capacity upgrade of high-speed OLIU circuit packs (in progress) at a node in a 1+1/UPSR/BLSR network.

1 Determine the status of the in-service high-speed OLIU circuit pack upgrade.

If...	Then...
original OLIU circuit pack in Main slot **M1** has been replaced and the **Configuration** → **Update System** → **Upgrade** command has *not* been performed,	Continue with Step 2.

If...	Then...
original OLIU circuit pack in Main slot **M1** has been replaced and the **Configuration** → **Update System** → **Upgrade** command has been performed,	Proceed to Step 4.
original OLIU circuit packs in Main slots **M1** and **M2** have been replaced,	Proceed to Step 7.

2 **Important!** The original OLIU circuit pack in Main slot **M1** has been replaced and the **Configuration** → **Update System** → **Upgrade** command has *not* been performed. The system reports an `unexpected CP type` alarm for Main slot **M1**. For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for Main slot **M1**.

Open the lower faceplate latch on the replacement OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**. Then replace the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** with the original OLIU circuit pack.

Reference: The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `inc. LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

3 Obtain the original LBO, clean all fiber connectors, and connect the transmit and receive optical fibers to the original OLIU circuit pack in Main slot **M1**.

Result: All alarms clear and service is restored after the provisionable wait-to-restore interval elapses. (The default is 5 minutes.) This applies to the local node and the adjacent node connected to the circuit pack in Main slot **M1**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

STOP! End of Procedure. This completes the backout procedure at the local node. If other nodes are to be backed out, go to the adjacent node connected to the circuit pack in Main slot **M1** and repeat this procedure.

4 

NOTICE

Service-disruption hazard

If backing out a Very Large Fabric (VLF) multiport, multirate LNW82 OC3/OC12/OC48 OLIU or Very Large Fabric (VLF) LNW59 OC-192 OLIU circuit pack upgrade, transmission hits (up to 100 ms) may occur as traffic is switched.

The length of the service hits varies based on shelf equipage and TDM service provisioning.

Important! The original OLIU circuit pack in Main slot **M1** has been replaced and the **Configuration** → **Update System** → **Upgrade** command has been performed. The replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** has been autoprovisioned, and the system has performed automatic protection switches. All traffic is now active on the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**.

The system reports an `unexpected CP type` alarm for Main slot **M2**. For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for Main slot **M2**.

The **UPD/INIT** button does not work during this procedure.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs automatic protection switches. Transmission hits (less than 60 ms) occur as traffic switches from the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** to the original OLIU circuit pack in Main slot **M2**. All traffic is now active on the original OLIU circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**.

For BLSR protection groups, the `Line Automatic Switch` condition for Main slot **M2** clears, and the system reports a `Line Automatic Switch` condition for Main slot **M1**.

Alarms may also be reported at other nodes in the network.

5 Open the lower faceplate latch on the replacement OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**. Then replace the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** with the original OLIU circuit pack.

Result: The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `inc. LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

6 Obtain the original LBO, clean all fiber connectors, and connect the transmit and receive optical fibers to the original OLIU circuit pack in Main slot **M1**.

Result: All alarms clear and service is restored after the provisionable wait-to-restore interval elapses. (The default is 5 minutes.) This applies to the local node and the adjacent node connected to the circuit pack in Main slot **M1**.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! End of Procedure. This completes the backout procedure at the local node. If other nodes are to be backed out, go to the adjacent node connected to the circuit pack in Main slot **M1** and repeat this procedure.

7 **Important!** The original OLIU circuit pack in Main slot **M2** has been replaced, and the `unexpected CP type` alarm for Main slot **M2** clears.

Open the lower faceplate latch on the replacement OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the replacement OLIU circuit pack/pluggable transmission module in Main slot **M2**. Then replace the replacement OLIU circuit pack/pluggable transmission module in Main slot **M2** with the original OLIU circuit pack.

Result: Transmission hits (less than 60 ms) may occur if traffic exists on the replacement OLIU circuit pack/pluggable transmission module in Main slot **M2**. If through traffic exists (UPSRs and BLSRs only), transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped.

The system reports an `unexpected CP type` alarm for Main slot **M2**.

For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for Main slot **M2**.

Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

8 Obtain the original LBO, clean all fiber connectors, and connect the transmit and receive optical fibers to the original OLIU circuit pack in Main slot **M2**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

9



NOTICE

Service-disruption hazard

If backing out a Very Large Fabric (VLF) multiport, multirate LNW82 OC3/OC12/OC48 OLIU or Very Large Fabric (VLF) LNW59 OC-192 OLIU circuit pack upgrade, transmission hits (up to 100 ms) may occur as traffic is switched.

The length of the service hits varies based on shelf equipage and TDM service provisioning.

Important! The **UPD/INIT** button does not work during this procedure.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs automatic protection switches. Transmission hits (less than 60 ms) occur as traffic switches from the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** to the original OLIU circuit pack in Main slot **M2**. All traffic is now active on the original OLIU circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**.

For BLSR protection groups, the `Line Automatic Switch` condition for Main slot **M2** clears, and the system reports a `Line Automatic Switch` condition for Main slot **M1**.

Alarms may also be reported at other nodes in the network.

10 Open the lower faceplate latch on the replacement OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1**. Then replace the replacement OLIU circuit pack/pluggable transmission module in Main slot **M1** with the original OLIU circuit pack.

Result: The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `inc. LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

11 Obtain the original LBO, clean all fiber connectors, and connect the transmit and receive optical fibers to the original OLIU circuit pack in Main slot **M1**.

Result: All alarms clear and service is restored after the provisionable wait-to-restore interval elapses. (The default is 5 minutes.) This applies to the local node and the adjacent node connected to the circuit pack in Main slot **M1**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

STOP! End of Procedure. This completes the backout procedure at the local node. If other nodes are to be backed out, go to the adjacent node connected to the circuit pack in Main slot **M1** and repeat this procedure.

END OF STEPS

Procedure 12-3: Upgrade OC-3 UPSR to OC-12 UPSR

Overview

Important! The Alcatel-Lucent 1665 DMX product family does *not* support upgrading a UPSR where all nodes are connected to the UPSR using single-rate circuit packs in the Function/Growth slots. At least one Alcatel-Lucent 1665 DMXtend or Alcatel-Lucent 1665 DMXplore node must be connected to the OC-3 UPSR using the Main slots and this node must be the starting node.

Use this procedure to upgrade an in-service OC-3 UPSR to an OC-12 UPSR.

Important! The UPSR must be equipped with Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, and/or Alcatel-Lucent 1665 DMXplore nodes only. This upgrade procedure does *not* support upgrading UPSRs equipped with nodes other than Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, and/or Alcatel-Lucent 1665 DMXplore.

This procedure assumes that one or more Alcatel-Lucent 1665 DMX nodes are interconnected in an OC-3 UPSR using the Main slots a port pair in the Function/Growth slots with:

- Alcatel-Lucent 1665 DMXtend: Alcatel-Lucent 1665 DMXtend nodes may be connected to the UPSR using the Main slots or a port pair in the Function/Growth slots.
- Alcatel-Lucent 1665 DMXplore: Alcatel-Lucent 1665 DMXplore nodes may be connected to the UPSR using Main slots only.

At nodes connected to the UPSR using single-rate circuit packs in the Main slots, the OC-3 circuit packs in the Main slots are replaced with OC-12 circuit packs. At nodes connected to the UPSR using single-rate circuit packs in the Function/Growth slots, traffic is bridged/rolled to an OC-12 port pair in a different Function/Growth group.

At nodes connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots equipped with single-rate pluggable transmission modules, the OC-3 pluggable transmission modules are replaced with OC-12 pluggable transmission modules.

At nodes connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots equipped with multirate pluggable transmission modules, the port Signal Type parameter of each port in the OC-3 port pair is independently reprovisioned to OC-12.

This procedure assumes that in the UPSR, the circuit pack in Main/Function/Growth slot 1 is always connected to the circuit pack in Main/Function/Growth slot 2 at the adjacent node. (Refer to the "UPSR example" (p. 12-40) at the end of the procedure.) If other

network connections exist, for example, the circuit pack in Main slot 2 is connected to the circuit pack in Function/Growth slot 2 at the adjacent node, modify this procedure as required.

Ring Upgrade Mode

During the upgrade, the following nodes must be provisioned in the Ring Upgrade Mode.

- Each node connected to the UPSR using single-rate circuit packs in the Main slots
- Each node connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main slots
- Each node connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Function/Growth slots.

During upgrades with single-rate circuit packs, the Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack.

During upgrades with multirate OC-3/OC-12/OC-48 OLIU circuit packs, the Ring Upgrade Mode allows ports in the protected port pair to be independently reprovisioned and operate at different rates.

The Ring Upgrade Mode prohibits the following operations:

- Software upgrades to the node (**APPLY**, **INS-PRGM**)
- Cross-connection provisioning (**ENT-CRS**, **DLT-CRS**)
- Manual equipment protection switching of the Function/Growth slots (**SW-TOPROTN**, **SW-TOWKG**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded ring, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, “System configuration procedures”.

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- As optical spans are upgraded around the UPSR, ensure that technicians are available at each end of an optical span as it is upgraded.
- At each Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend node connected to the UPSR using single-rate circuit packs in the Function/Growth slots, an OC-12 port pair on an LNW46 or LNW49 OC-12 OLIU circuit pack pair in a different Function/Growth group

If required, install the OC-12 OLIU circuit packs/pluggable transmission modules in the Function/Growth group and provision the OC-12 port and DCC termination parameters. Refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures".

- At each Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend node connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots, 2 replacement OC-12 pluggable transmission modules *may* be required.

  To determine whether the pluggable transmission module to be upgraded supports a single optical rate or multiple optical rates, select **View** → **Equipment** and expand the required circuit pack. Click on the original pluggable transmission module and **Select** to obtain the pluggable transmission module information.
- Refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for the single-rate circuit packs required at Alcatel-Lucent 1665 DMXtend nodes connected to the UPSR using the Main slots.
- Refer to the *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332* for the single-rate circuit packs required at Alcatel-Lucent 1665 DMXplore nodes connected to the UPSR using the Main slots.

Important! The replacement circuit packs/ports/pluggable transmission modules *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.

Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the UPSR and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-12 OLIU circuit packs. Ensure that the OC-12 OLIU circuit packs are compatible with each fiber span in the UPSR. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Applications and Planning Guide, 365-372-324* and *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Applications and Planning Guide, 365-372-400*.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description* and *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Software Release Description*.
5. If required, eview the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* and *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332* for procedures or cautions that may apply to this upgrade procedure.
6. Determine the local operating procedures for removing a circuit pack/pluggable transmission module. Local operating procedures for removing a circuit pack/pluggable transmission module may vary. One method is to disconnect the optical fibers and remove the circuit pack/pluggable transmission module. Another method is to verify the circuit pack/port active/standby status, perform manual switches if the circuit pack/port is active, and then disconnect the optical fibers and remove the circuit pack/pluggable transmission module.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-3 UPSR to an OC-12 UPSR.

1 From office records and work instructions, determine the current network configuration. Note how the nodes are connected in the ring and make a drawing of the ring to reference during this upgrade.

2 **Important!** The starting node must be connected to the UPSR using the Main slots. This procedure assumes that the starting node is a Alcatel-Lucent 1665 DMX.

Identify and log in to the Alcatel-Lucent 1665 DMX starting node. (Refer to the "UPSR example" (p. 12-40) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble-clearing procedures to clear all existing alarms before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*
- *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) Alarms Messages and Trouble Clearing Guide, 365-372-333*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*
- *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) Alarms Messages and Trouble Clearing Guide, 365-372-333*

5 **Important!** Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support test access.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

6 At each of the remaining nodes in the UPSR, log in to the node and repeat Step 3 through Step 5. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 

NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-3.4: "Verify spanning tree configuration" (p. 12-55)

8 At the Alcatel-Lucent 1665 DMX starting node (refer to the "UPSR example" (p. 12-40) at the end of the procedure), select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-27).

9 If required, verify the active/standby status of the OC-3 port on the multirate circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-3.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-53)

10 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-3 circuit pack/port is upgraded at each end of the optical span.

If the circuit pack/port is active for timing and/or transmission, disconnecting fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

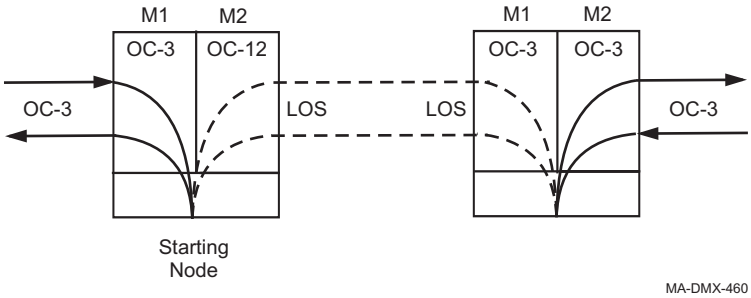
If Main slot M2 is equipped with an...	Then...
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a single-rate OC-3 pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-3 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring. 2. Disconnect the optical fibers from the OC-3 pluggable transmission module in Main slot **M2**. 3. Replace the OC-3 pluggable transmission module in Main slot **M2** with the replacement OC-12 pluggable transmission module. **Result:** The replacement OC-12 pluggable transmission module in Main slot **M2** is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a multirate OC-3/OC-12/OC-48 pluggable transmission module,	Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-3 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**. **Result:** The system reports an `inc. OC12 LOF` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

This completes the first phase of the UPSR upgrade at the starting node. The starting node upgrade will be completed after all the other nodes in the ring are upgraded.

The following figure shows the state of the starting node and the adjacent optical spans.

Important! If the upgraded OC-12 port in Main slot **M2** at the starting node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



11 Log in to the adjacent node connected to Main/Function/Growth slot 2. (Refer to the "UPSR example" (p. 12-40) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

12 Determine how the node is connected to the UPSR and upgrade the UPSR connections.

If...	Then upgrade the UPSR connections using...
Alcatel-Lucent 1665 DMX connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	Procedure 12-3.1: "Upgrade low-speed OC-3 UPSR connections at node with single-rate circuit packs" (p. 12-42). Then continue with Step 13.
Alcatel-Lucent 1665 DMX connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots,	Procedure 12-3.2: "Upgrade OC-3 UPSR connections at node with multirate circuit packs" (p. 12-48). Then continue with Step 13.

If...	Then upgrade the UPSR connections using...
Alcatel-Lucent 1665 DMXtend connected to the UPSR using single-rate circuit packs in the Main slots,	*Procedure 12-1.1: Upgrade high-speed OC-3 UPSR connections at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 13.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	*Procedure 12-1.2: Upgrade low-speed OC-3 UPSR connections at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 13.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots,	*Procedure 12-1.5: Upgrade OC-3 UPSR connections at node with multirate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 13.
Alcatel-Lucent 1665 DMXplore,	*Procedure 12-3.1: Upgrade UPSR connections at node* in *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*. Then continue with Step 13.

13 Except for the starting node, have all nodes in the UPSR been upgraded?

If...	Then...
No,	Repeat Step 11 and Step 12 as required at the next node. (Refer to the "UPSR example" (p. 12-40) at the end of the procedure.)
Yes,	Continue with Step 14.

14 Log in to the starting node. (Refer to the "UPSR example" (p. 12-40) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

15 If required, verify the active/standby status of the OC-3 port on the multirate circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-3.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-53)

16 Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M1**. Click on the required OC-3 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**.

Result:

If the multirate circuit pack in Main slot M1 is equipped with a...	Then...
single-rate OC-3 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1**. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-12 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-12 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-12 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the upgraded OC-12 optical span.

17 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-3 pluggable transmission module in Main slot **M1**. Then replace the single-rate OC-3 pluggable transmission module in Main slot **M1** with the replacement OC-12 pluggable transmission module.

Result: The replacement OC-12 pluggable transmission module in Main slot **M1** is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

18 If required at both ends of the optical span to be upgraded, perform the following to connect the replacement OC-12 circuit pack/port in Main slot **M1** and the required OC-12 circuit pack/port at the opposite end of the upgraded OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

19 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-12 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

20 **Important!** At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*
- *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) Alarms Messages and Trouble Clearing Guide, 365-372-333*

21 At each node connected to the UPSR using single-rate circuit packs in the Function/Growth slots, select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. OC3 LOS` alarms for the original OC-3 ports clear.

22 At each node connected to the UPSR using single-rate circuit packs in the Function/Growth slots, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add and through cross-connections to the original OC-3 ports.

23 **Important!** The UPSR network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node can *not* be returned to the pre-upgrade state using the backout procedure.

At each node connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

24 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs/port pairs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the UPSR, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

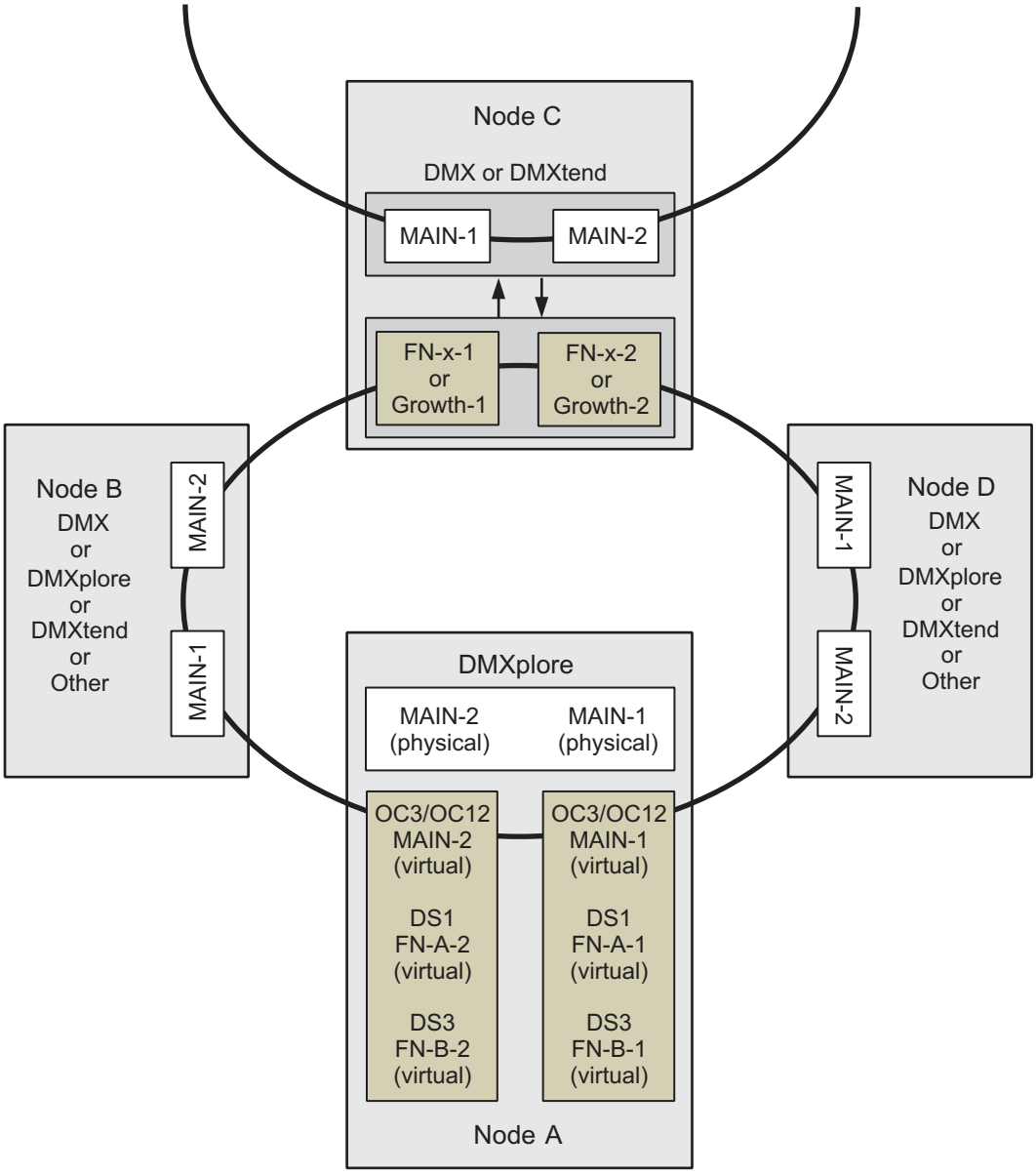
END OF STEPS

UPSR example

Starting Node: Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, or Alcatel-Lucent 1665 DMXplore connected to the UPSR using the Main Slots

Starting Circuit Pack: Main-2 at the Starting Node

Direction of Upgrade: Clockwise around UPSR from Main-2 at the Starting Node to Main/Function/Growth slot 1 at the adjacent node



DMX = 1665 Data Multiplexer
DMXplore = 1665 Data Multiplexer Explore
DMXtend = 1665 Data Multiplexer Extend

MA-DMXplore-046

Procedure 12-3.1: Upgrade low-speed OC-3 UPSR connections at node with single-rate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

When upgrading connections to a UPSR using a port pair on single-rate circuit packs in the Function/Growth slots, the node is *not* required to be in the provisioned Ring Upgrade Mode.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service UPSR connections at a Alcatel-Lucent 1665 DMX node connected to the UPSR using a port pair on single-rate circuit packs in the Function/Growth slots.

1 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the OC-3 ports that are to be upgraded, the Optical Synchronization Source must be reprovisioned to an upgrade OC-12 port or to a different OC-n port not involved in the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

2 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an upgrade OC-12 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the upgrade OC-12 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

3 **Important!** An OC-12 port pair must be available in a different Function/Growth group.

To verify that the upgrade OC-12 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the upgrade OC-12 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

4 To verify that the upgrade OC-12 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the upgrade OC-12 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

5 **Important!** All cross-connections at this node that are associated with the existing OC-3 UPSR must be identified so that traffic can be moved to the OC-12 UPSR.

Select **View** → **Cross-Connections**. Expand the required OC-3 OLIU circuit pack in slot 1 of the Function/Growth group that is currently connected to the OC-3 UPSR. Click on the required OC-3 port and **Select** to obtain the current list of cross-connections. Identify and record all through, add, drop, and UPSR Dual Ring Interworking cross-connections. Click **Close** to exit.

Important! A UPSR Dual Ring Interworking cross-connection consists of a 1-way add, a 1-way through, and a 1-way path protected drop cross-connection. To verify that a cross-connection leg is part of a UPSR Dual Ring Interworking cross-connection, click on the cross-connection leg in the list of cross-connections and click **View Graphic**.

For additional information about UPSR Dual Ring Interworking cross-connections, refer to Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58).

6 For each *UPSR Dual Ring Interworking* cross-connection identified in Step 5, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the UPSR Dual Ring Interworking cross-connections. Then use the *Cross-Connection Wizard* to create the same UPSR Dual Ring Interworking cross-connections on the required OC-12 port pair in the other Function/Growth group.

Result: Transmission hits (less than 60 ms) may occur. Alarms may be reported at other nodes in the ring.

Reference: Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58)

7 **Important!** Do *not* perform this step for a 1-way through cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *through* cross-connection identified in Step 5 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to create the same through cross-connections on the required OC-12 port pair in the other Function/Growth group.

Reference: Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)

8 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Disconnect the transmit and receive optical fibers from the required OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports an `inc. OC3 LOS` alarm for the OC-3 port.

9 If required at both ends of the optical span to be upgraded, perform the following to connect the OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group and the required OC-12 circuit pack/port at the opposite end of the upgraded OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

10 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

11 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-12 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

12 **Important!** Do *not* perform this step for a 1-way add cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *add* cross-connection identified in Step 5 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

13 **Important!** Do *not* perform this step for a 1-way path protected drop cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *drop* cross-connection identified in Step 5 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

14 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

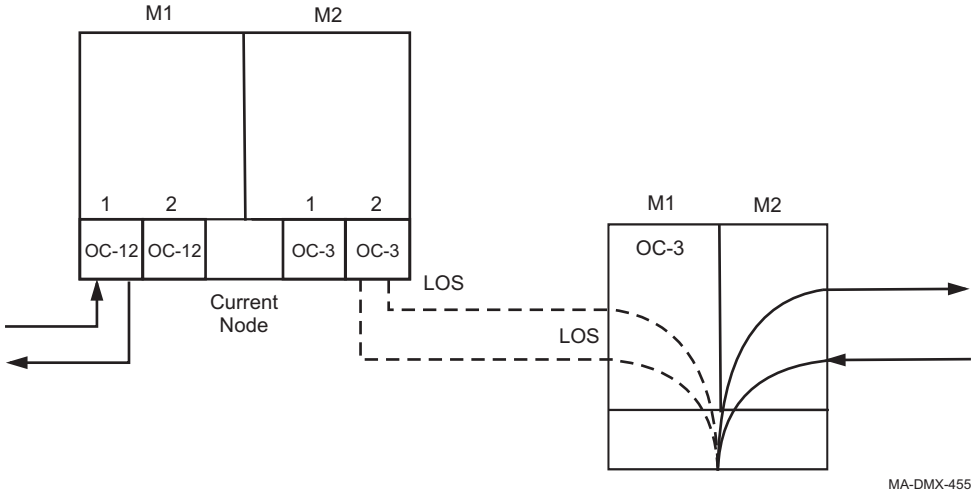
Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-3 circuit pack/port is upgraded at each end of the optical span.

Disconnect the transmit and receive optical fibers from the required OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports `inc. OC3 LOS` alarms for the original OC-3 ports. Alarms may also be reported at other nodes in the ring.

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-3.2: Upgrade OC-3 UPSR connections at node with multirate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service UPSR connections at a Alcatel-Lucent 1665 DMX node connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots.

1 **Important!** The Ring Upgrade Mode is required to allow ports in the protected port pair to be independently reprovisioned and operate at different rates.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-27).

2 If required, verify the active/standby status of the OC-3 port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-3.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-53)

3 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required OC-3 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate OC-3 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-12 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-12 LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-12 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the upgraded OC-12 optical span.

4 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-3 pluggable transmission module in Main/Function/Growth slot 1. Then replace the single-rate OC-3 pluggable transmission module in Main/Function/Growth slot 1 with the replacement OC-12 pluggable transmission module.

Result: The replacement OC-12 pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. OC12 LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 If required at both ends of the optical span to be upgraded, perform the following to connect the replacement OC-12 pluggable transmission module in Main/Function/Growth slot 1 and the required circuit pack/port at the opposite end of the upgraded OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the upgraded OC-12 optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

6 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-12 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 If required, verify the active/standby status of the OC-3 port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-3.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-53)

8 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required OC-3 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate OC-3 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module,	The system reports an `inc. OC12 LOF` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

9 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the circuit pack/port is upgraded at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-3 pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate OC-3 pluggable transmission module in Main/Function/Growth slot 2 with the replacement OC-12 pluggable transmission module.

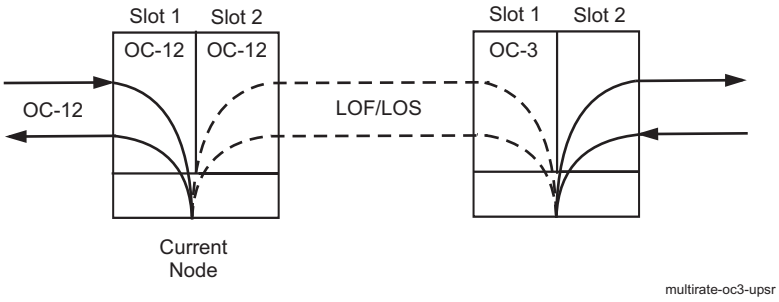
Result: The replacement OC-12 pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. OC12 LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

The following figure shows the state of the current node and the adjacent optical spans.

Important! If the upgraded OC-12 port in Main/Function/Growth slot 2 at the current node is equipped with a single-rate pluggable transmission module, `inc. LOS` alarms are reported. If the upgraded OC-12 port in Main/Function/Growth slot 2 at the current node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-3.3: Verify active/standby status of circuit pack/port to be upgraded

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack/port to be upgraded and perform manual switches to switch traffic away from an active circuit pack/port.

1 **Important!** If the circuit pack to be upgraded is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be upgraded.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be upgraded is the active circuit pack for timing, an optional manual timing switch can be performed before upgrading the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be upgraded is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be upgraded is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack/port to be upgraded is the active circuit pack/port for transmission and the circuit pack/port is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack/port to be upgraded.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack/port to be upgraded (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack/port to be upgraded). Click **Close**.

5 **Important!** If the circuit pack/port to be upgraded is an active circuit pack for transmission, optional manual switches can be performed before upgrading the circuit pack/port. In UPSRs, each path supported by the circuit pack/port to be upgraded must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack/port to be upgraded is *not* the active circuit pack/port for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack/port to be upgraded. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack/port to be upgraded is *not* the active circuit pack/port for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-3.4: Verify spanning tree configuration

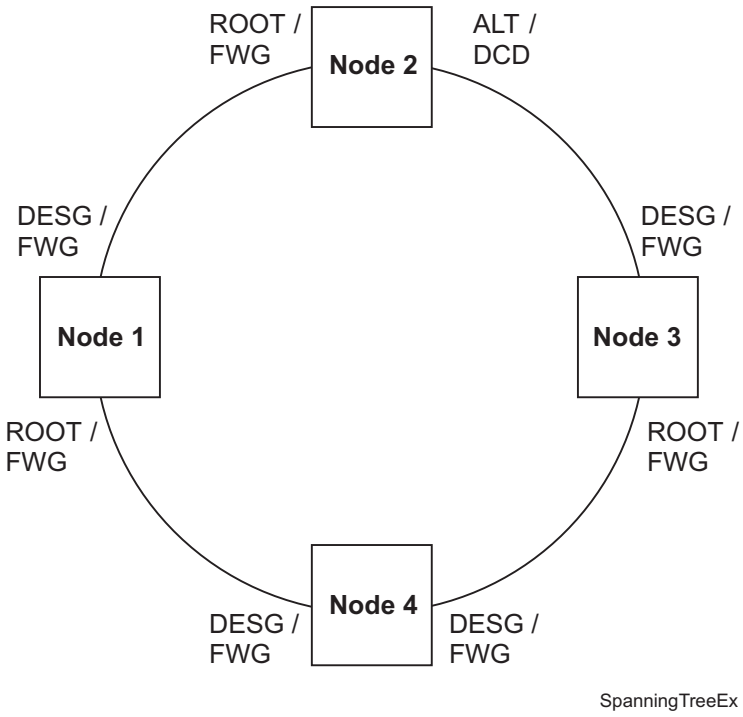
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-55).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If required, change the existing spanning tree configuration.

If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-4: Back out OC-3 UPSR to OC-12 UPSR upgrade

Overview

NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the UPSR using single-rate circuit packs in the Main slots or multirate circuit packs in the Main/Function/Growth slots must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out an OC-3 UPSR to OC-12 UPSR upgrade.

Backing out of an upgrade in progress returns *all* nodes in the ring to their pre-upgrade state.

To temporarily stop the upgrade at a Alcatel-Lucent 1665 DMX node connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots, refer to Procedure 12-37: “Suspend UPSR/1+1 upgrade at node (multirate circuit packs)” (p. 12-679).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OC-3 OLIU circuit packs/port pairs for each node to be backed out
- As the upgrade is backed out around the UPSR, ensure that technicians are available at each end of an optical span as the upgrade is backed out.

NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description* and *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Software Release Description*.
3. Review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* and *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332* for procedures or cautions that may apply to this backout procedure.
4. Determine the local operating procedures for removing a circuit pack/pluggable transmission module. Local operating procedures for removing a circuit pack/pluggable transmission module may vary. One method is to disconnect the optical fibers and remove the circuit pack/pluggable transmission module. Another method is to verify the circuit pack/port active/standby status, perform manual switches if the circuit pack/port is active, and then disconnect the optical fibers and remove the circuit pack/pluggable transmission module.

Steps

Important! This procedure starts at the last node upgraded.

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out of an OC-3 UPSR to OC-12 UPSR upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the Alcatel-Lucent 1665 DMX starting node, and the ring upgrade is complete (all nodes connected to the UPSR using single-rate circuit packs in the Main slots or multirate circuit packs in the Main/Function/Growth slots are in the Ring Upgrade Mode),	Log in to the Alcatel-Lucent 1665 DMX starting node (refer to the "UPSR example" (p. 12-68) at the end of the procedure) and continue with Step 3.
not the Alcatel-Lucent 1665 DMX starting node,	Log in to the last node upgraded (refer to the "UPSR example" (p. 12-68) at the end of the procedure) and proceed to Step 6.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 If required, verify the active/standby status of the OC-12 OLIU circuit pack/port in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-4.3: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-79)

4 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack/port is backed out at each end of the optical span.

If the circuit pack/port is active for timing and/or transmission, opening the latch or disconnecting fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If Main slot M1 was originally equipped with an...	Then...
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a single-rate OC-12 pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M1**. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-3 and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring. 2. Disconnect the optical fibers from the OC-12 pluggable transmission module in Main slot **M1**. 3. Replace the OC-12 pluggable transmission module in Main slot **M1** with the original OC-3 pluggable transmission module. **Result:** The original OC-3 pluggable transmission module in Main slot **M1** is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1** clears, and the system reports an `inc. OC3 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a multirate OC-3/OC-12/OC-48 pluggable transmission module,	Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M1**. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-3 and click **Apply**. **Result:** The system reports an `inc. OC3 LOF` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

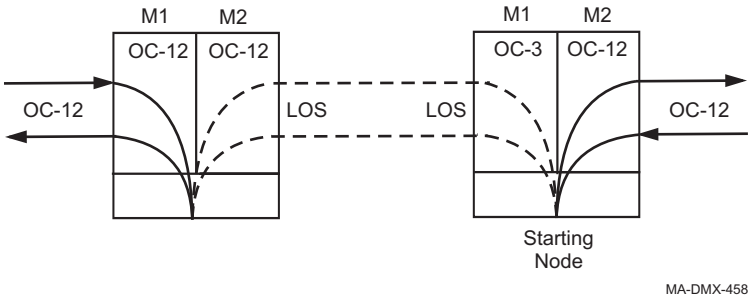
Reference:

- Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

This completes the first phase of the backout at the starting node. The backout at the starting node will be completed after backing out of all the other nodes in the ring.

The following figure shows the state of the starting node and the adjacent optical spans.

Important! If the original OC-3 port in Main slot **M1** at the starting node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



5 Log in to the adjacent node connected to Main/Function/Growth slot 1. (Refer to the "UPSR example" (p. 12-68) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

6 Determine how the node is connected to the UPSR and back out the upgrade at the node.

If...	Then back out the UPSR upgrade using...
Alcatel-Lucent 1665 DMX connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	Procedure 12-4.1: "Back out low-speed OC-3 to OC-12 UPSR upgrade at node with single-rate circuit packs" (p. 12-69). Then continue with Step 7.
Alcatel-Lucent 1665 DMX connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots,	Procedure 12-4.2: "Back out OC-3 UPSR to OC-12 UPSR upgrade at node with multirate circuit packs" (p. 12-74). Then continue with Step 7.

If...	Then back out the UPSR upgrade using...
Alcatel-Lucent 1665 DMXtend connected to the UPSR using single-rate circuit packs in the Main slots,	*Procedure 12-2.1: Back out high-speed OC-3 UPSR to OC-12 UPSR upgrade at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 7.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	*Procedure 12-2.2: Back out low-speed OC-3 UPSR to OC-12 UPSR upgrade at node with single circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 7.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using multlirate circuit packs in the Main/Function/Growth slots,	*Procedure 12-4.5: Back out OC-3 UPSR to OC-12 UPSR upgrade at node with multirate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 7.
Alcatel-Lucent 1665 DMXplore,	*Procedure 12-4.1: Back out UPSR upgrade at node* in *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) User Operations Guide, 365-372-332*. Then continue with Step 7.

7 Except for the starting node, has the upgrade been backed out of all nodes in the UPSR?

If...	Then...
No,	Repeat Step 5 and Step 6, as required, at the next node. (Refer to the "UPSR example" (p. 12-68) at the end of the procedure.)
Yes,	Continue with Step 8.

8 Log in to the starting node. (Refer to the "UPSR example" (p. 12-68) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9 If required, verify the active/standby status of the OC-12 port on the multirate circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-4.3: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-79)

10 Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-3 and click **Apply**.

Result:

If the multirate circuit pack in Main slot M2 is equipped with a...	Then...
single-rate OC-12 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2**. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the original OC-3 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-3 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the original OC-3 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the original OC-3 optical span.

11 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-12 pluggable transmission module in Main slot **M2**. Then replace the single-rate OC-12 pluggable transmission module in Main slot **M2** with the original OC-3 pluggable transmission module.

Result: The original OC-3 pluggable transmission module in Main slot **M2** is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2** clears, and the system reports an `inc. OC3 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

12 If required at both ends of the optical span to be backed out, perform the following to connect the original OC-3 circuit pack/port in Main slot **M2** and the required OC-3 circuit pack/port at the opposite end of the original OC-3 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-3 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC3 LOS` alarms clear. Transmission is now supported on the original OC-3 optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

13 **Important!** Perform this step only if the opposite end of the original optical span is an OC-3 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-3 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

14 **Important!** At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*
- *Alcatel-Lucent 1665 Data Multiplexer Explore (DMXplore) Alarms Messages and Trouble Clearing Guide, 365-372-333*

15 **Important!** This completes the backout procedure, except for taking the nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots out of the Ring Upgrade Mode. The decision to take these nodes out of the Ring Upgrade Mode or leave them depends on the reason the backout was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, UPSR cross-connections cannot be created or removed.

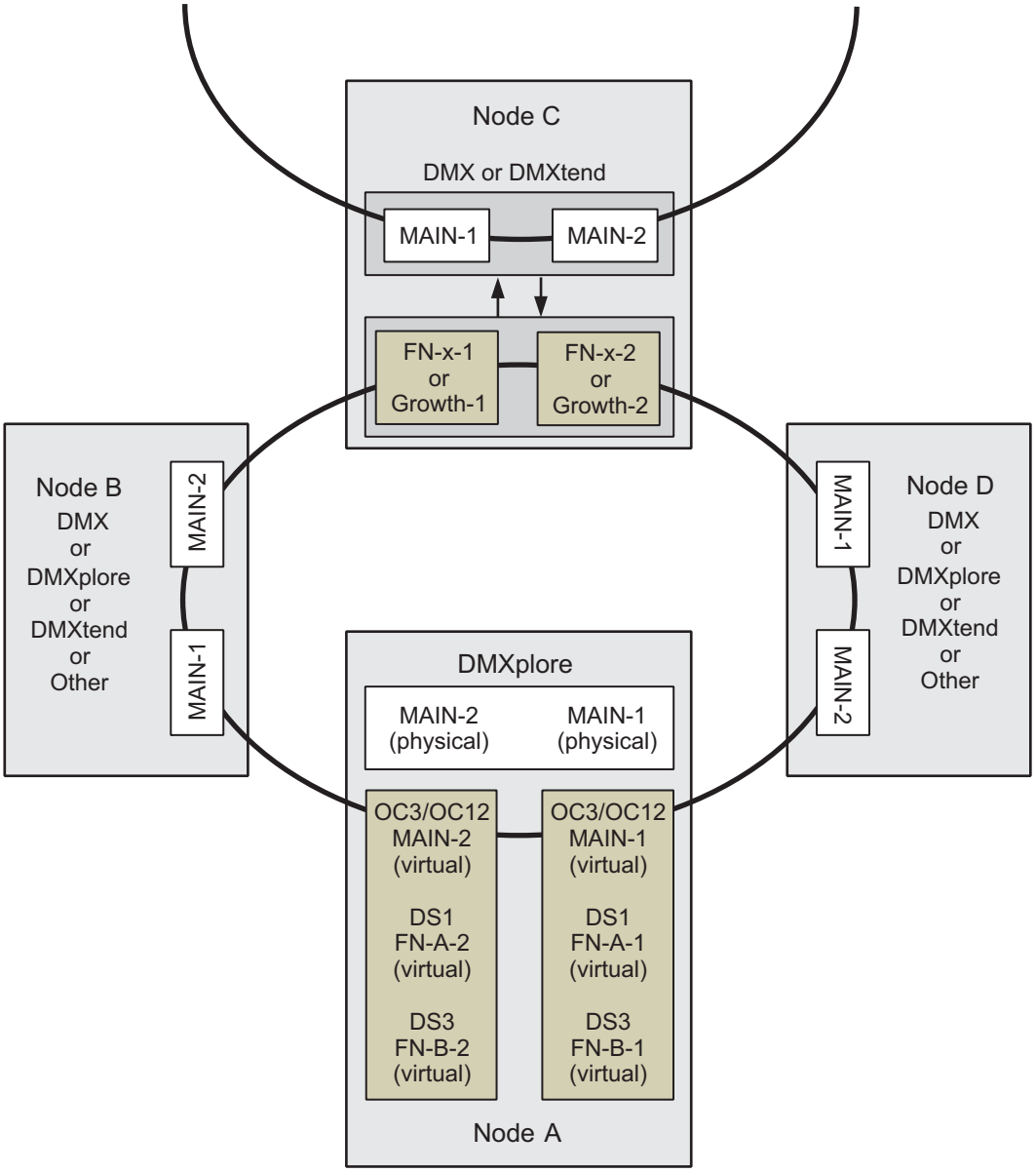
If required at each node connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, select **Configuration → Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

UPSR example



DMX = 1665 Data Multiplexer
DMXplore = 1665 Data Multiplexer Explore
DMXtend = 1665 Data Multiplexer Extend

MA-DMXplore-046

Procedure 12-4.1: Back out low-speed OC-3 to OC-12 UPSR upgrade at node with single-rate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX node is still equipped with the original OC-3 OLIU circuit packs/pluggable transmission modules.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-3 UPSR to OC-12 UPSR upgrade at a Alcatel-Lucent 1665 DMX node connected to the UPSR using a port pair on single-rate circuit packs in the Function/Growth slots.

1 Determine the current status of the upgrade at the node.

If the port in...	Then...
both Function/Growth slot 1 and 2 have been upgraded to OC-12 ports,	Continue with Step 2.
only Function/Growth slot 1 has been upgraded to an OC-12 port,	Proceed to Step 14.

2 To verify that the original OC-3 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the original OC-3 port pair according to the office records using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

3 To verify that the original OC-3 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the original OC-3 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

4 **Important!** All cross-connections at this node that are associated with the OC-12 UPSR must be identified so that traffic can be moved back to the original OC-3 UPSR.

Select **View** → **Cross-Connections**. Expand the required OC-12 OLIU circuit pack in slot 2 of the Function/Growth group that is currently connected to the UPSR. Click on the required OC-12 port and **Select** to obtain the current list of cross-connections. Identify and record all through, add, drop, and UPSR Dual Ring Interworking cross-connections. Click **Close** to exit.

Important! A UPSR Dual Ring Interworking cross-connection consists of a 1-way add, a 1-way through, and a 1-way path protected drop cross-connection. To verify that a cross-connection leg is part of a UPSR Dual Ring Interworking cross-connection, click on the cross-connection leg in the list of cross-connections and click **View Graphic**.

For additional information about UPSR Dual Ring Interworking cross-connections, refer to Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58).

5 Repeat Step 4 to obtain a current list of cross-connections for the original OC-3 port in slot 2 of the other Function/Growth group. Compare the original OC-3 port cross-connection list with the upgrade OC-12 port cross-connection list.

6 For each *UPSR Dual Ring Interworking* cross-connection identified in Step 4, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the UPSR Dual Ring Interworking cross-connections. Then use the *Cross-Connection Wizard* to create the same UPSR Dual Ring Interworking cross-connections on the original OC-3 port pair in the other Function/Growth group.

Result: Transmission hits (less than 60 ms) may occur. Alarms may be reported at other nodes in the ring.

Reference: Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58)

7 **Important!** Do *not* perform this step for a 1-way through cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *through* cross-connection identified in Step 4 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to create the same through cross-connections on the original OC-3 port pair in the other Function/Growth group.

Reference: Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)

8



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Disconnect the transmit and receive optical fibers from the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports an `inc. OC12 LOS` alarm for the OC-12 port.

9 If required at both ends of the optical span to be backed out, perform the following to connect the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group and the required OC-3 circuit pack/port at the opposite end of the original OC-3 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-3 circuit packs.)
3. Clean and connect the receive fibers.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

10 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

11 **Important!** Perform this step only if the opposite end of the original optical span is an OC-3 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-3 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

12 **Important!** Do *not* perform this step for a 1-way add cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *add* cross-connection identified in Step 4 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

13 **Important!** Do *not* perform this step for a 1-way path protected drop cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *drop* cross-connection identified in Step 4 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

14 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack/port is backed out at each end of the optical span.

Disconnect the transmit and receive optical fibers from the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports `inc. LOS` alarms for the upgrade OC-12 ports and the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group. Alarms may also be reported at other nodes in the ring.

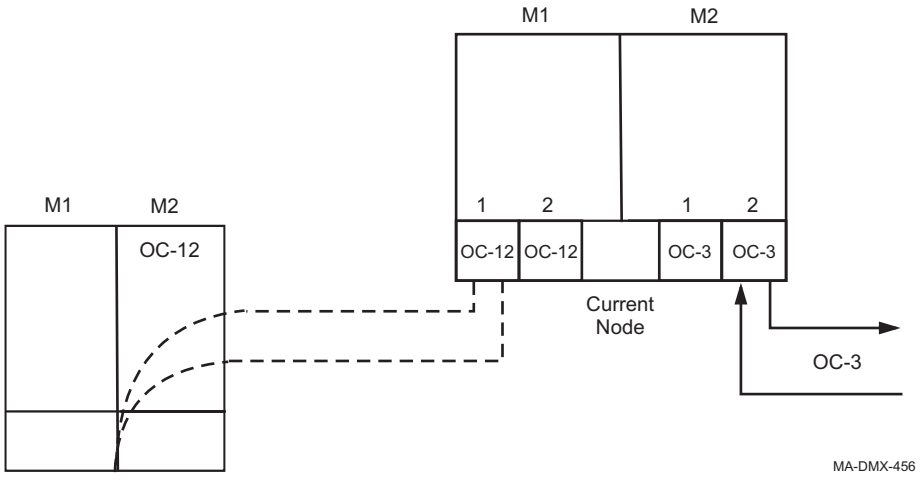
15 Select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. LOS` alarms clear.

16 Select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add and through cross-connections to the upgrade OC-12 ports.

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-4.2: Back out OC-3 UPSR to OC-12 UPSR upgrade at node with multirate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-3 UPSR to OC-12 UPSR upgrade at an Alcatel-Lucent 1665 DMX node connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots.

1 Determine the current status of the upgrade at the node.

If the pluggable transmission module in...	Then...
both Main/Function/Growth slots have been upgraded,	Continue with Step 2.
only Main/Function/Growth slot 1 has been upgraded,	Proceed to Step 7.

2 If required, verify the active/standby status of the OC-12 port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-4.3: “Verify active/standby status of circuit pack/port to be backed out” (p. 12-79)

3 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-3 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate OC-12 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the original OC-3 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-3 LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the original OC-3 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the original OC-3 optical span.

4 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 2 with the original OC-3 pluggable transmission module.

Result: The original OC-3 pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. OC3 LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 If required at both ends of the optical span to be upgraded, perform the following to connect the original OC-3 pluggable transmission module in Main/Function/Growth slot 2 and the required circuit pack/port at the opposite end of the original OC-3 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-3 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC3 LOS` alarms clear. Transmission is now supported on the original OC-3 optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

6 **Important!** Perform this step only if the opposite end of the original optical span is an OC-3 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-3 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 If required, verify the active/standby status of the OC-12 port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-4.3: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-79)

8 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-3 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate OC-12 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module,	The system reports an `inc. OC3 LOF` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.

9 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the circuit pack/port is backed out at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 1. Then replace the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 1 with the original OC-3 pluggable transmission module.

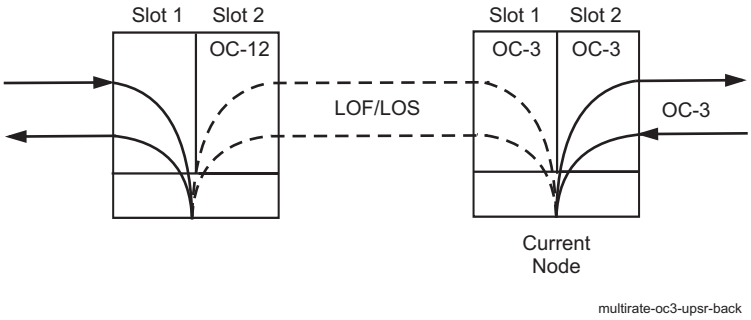
Result: The original OC-3 pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. OC3 LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

The following figure shows the state of the current node and the adjacent optical spans.

Important! If the original OC-3 port in Main/Function/Growth slot 1 at the current node is equipped with a single-rate pluggable transmission module, `inc. LOS` alarms are reported. If the original OC-3 port in Main/Function/Growth slot 1 at the current node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-4.3: Verify active/standby status of circuit pack/port to be backed out

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack/port to be backed out and perform manual switches to switch traffic away from an active circuit pack/port .

1 **Important!** If the circuit pack to be backed out is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be backed out.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be backed out is the active circuit pack for timing, an optional manual timing switch can be performed before backing out the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be backed out is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be backed out is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack/port to be backed out is the active circuit pack/port for transmission and the circuit pack/port is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack/port to be backed out.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack to be replaced (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack to be replaced). Click **Close**.

5 **Important!** If the circuit pack/port to be backed out is an active circuit pack/port for transmission, optional manual switches can be performed before backing out the circuit pack. In UPSRs, each path supported by the circuit pack/port to be backed out must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack/port to be backed out is *not* the active circuit pack/port for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack/port to be backed out. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack/port to be backed out is *not* the active circuit pack/port for transmission.

STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-5: Upgrade OC-12 UPSR to OC-48 UPSR

Overview

Important! Alcatel-Lucent 1665 DMX product family does *not* support upgrading a UPSR where all nodes are connected to the UPSR using single-rate circuit packs in the Function/Growth slots. At least one node must be connected to the UPSR using the Main slots and this node must be the starting node.

Use this procedure to upgrade an in-service OC-12 UPSR to an OC-48 UPSR.

Important! The UPSR must be equipped with Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend nodes only. This upgrade procedure does *not* support upgrading UPSRs equipped with nodes other than Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend.

This procedure assumes that one or more Alcatel-Lucent 1665 DMX nodes are interconnected in an OC-12 UPSR using the Main slots or a port pair in the Function/Growth slots with Alcatel-Lucent 1665 DMXtend. Alcatel-Lucent 1665 DMXtend nodes may be connected to the UPSR using the Main slots or a port pair in the Function/Growth slots.

At nodes connected to the UPSR using single-rate circuit packs in the Main slots, the OC-12 circuit packs in the Main slots are replaced with OC-48 circuit packs. At nodes connected to the UPSR using single-rate circuit packs in the Function/Growth slots, traffic is bridged/rolled to an OC-48 port pair in a different Function/Growth group.

At nodes connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots equipped with single-rate pluggable transmission modules, the OC-12 pluggable transmission modules are replaced with OC-48 pluggable transmission modules.

At nodes connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots equipped with multirate pluggable transmission modules, the port Signal Type parameter of each port in the OC-12 port pair is independently reprovisioned to OC-48.

This procedure assumes that in the UPSR, the circuit pack in Main/Function/Growth slot 1 is always connected to the circuit pack in Main/Function/Growth slot 2 at the adjacent node. (Refer to the "UPSR example" (p. 12-100) at the end of the procedure.) If other network connections exist, for example, the circuit pack in Main slot 2 is connected to the circuit pack in Function/Growth slot 2 at the adjacent node, modify this procedure as required.

Ring Upgrade Mode

During the upgrade, the following nodes must be provisioned in the Ring Upgrade Mode.

- Each node connected to the UPSR using single-rate circuit packs in the Main slots
- Each node connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main slots
- Each node connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Function/Growth slots.

During upgrades with single-rate circuit packs, the Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack.

During upgrades with multirate OC-3/OC-12/OC-48 OLIU circuit packs, the Ring Upgrade Mode allows ports in the protected port pair to be independently reprovisioned and operate at different rates.

The Ring Upgrade Mode prohibits the following operations:

- Software upgrades to the node (**`APPLY`**, **`INS-PRGM`**)
- Cross-connection provisioning (**`ENT-CRS`**, **`DLT-CRS`**)
- Manual equipment protection switching of the Function/Growth slots (**`SW-TOPROTN`**, **`SW-TOWKG`**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded ring, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, “System configuration procedures”.

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- As optical spans are upgraded around the UPSR, ensure that technicians are available at each end of an optical span as it is upgraded.
- If Main slot **M2** at the Alcatel-Lucent 1665 DMX starting node is to be upgraded with an LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack, one LNW26B OC-48 OLIU circuit pack with the enhanced/normal jumper set to enhanced is temporarily required.

An LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack may also be used as the temporary replacement circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.

The LNW26B, LNW28, LNW77, and LNW121B-159B circuit packs have been DA'ed; however, there are limited number of codes available. Please contact you Account Executive to obtain the required circuit pack to complete this upgrade. Also refer to Appendix B, "Circuit pack availability".

Product ID	Ordering Description
109543926	Circuit Pack, 1665 DMX, Reuse, LNW26B, OC48
109550707	Circuit Pack, 1665 DMX, Reuse, LNW28, OC48
109548081	Circuit Pack, 1665 DMX, Reuse, LNW77, OC48
109549683	Circuit Pack, 1665 DMX, Reuse, LNW121B, OC48
109549691	Circuit Pack, 1665 DMX, Reuse, LNW123B, OC48
109549709	Circuit Pack, 1665 DMX, Reuse, LNW125B, OC48
109549717	Circuit Pack, 1665 DMX, Reuse, LNW127B, OC48
109549808	Circuit Pack, 1665 DMX, Reuse, LNW131B, OC48
109549824	Circuit Pack, 1665 DMX, Reuse, LNW133B, OC48
109549907	Circuit Pack, 1665 DMX, Reuse, LNW135B, OC48
109549915	Circuit Pack, 1665 DMX, Reuse, LNW137B, OC48
109549923	Circuit Pack, 1665 DMX, Reuse, LNW143B, OC48
109549931	Circuit Pack, 1665 DMX, Reuse, LNW145B, OC48
109549949	Circuit Pack, 1665 DMX, Reuse, LNW147B, OC48

Product ID	Ordering Description
109549956	Circuit Pack, 1665 DMX, Reuse, LNW149B, OC48
109549964	Circuit Pack, 1665 DMX, Reuse, LNW153B, OC48
109549972	Circuit Pack, 1665 DMX, Reuse, LNW155B, OC48
109549980	Circuit Pack, 1665 DMX, Reuse, LNW157B, OC48
109549998	Circuit Pack, 1665 DMX, Reuse, LNW159B, OC48

- At each Alcatel-Lucent 1665 DMX node connected to the UPSR using single-rate circuit packs in the Main slots, 2 replacement LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs.
- At each Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend node connected to the UPSR using single-rate circuit packs in the Function/Growth slots, an OC-48 port pair on an LNW31, LNW55, LNW62, LNW402, or LNW421–LNW459 OC-48 OLIU circuit pack pair in a different Function/Growth group.

  The LNW421, LNW423, LNW431, LNW433, LNW435, LNW437, LNW443, LNW445, and LNW457 circuit packs are DA'ed and are no longer available.

  If required, install the OC-48 OLIU circuit packs in the Function/Growth group and provision the OC-48 port and DCC termination parameters. Refer to Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17).
- At each Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend node connected to the UPSR using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots, 2 replacement OC-48 pluggable transmission modules *may* be required.

  To determine whether the pluggable transmission module to be upgraded supports a single optical rate or multiple optical rates, select **View** → **Equipment** and expand the required circuit pack. Click on the original pluggable transmission module and **Select** to obtain the pluggable transmission module information.
- Refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for the circuit packs required at Alcatel-Lucent 1665 DMXtend nodes connected to the UPSR using the Main slots.

  Important! The replacement circuit packs/ports/pluggable transmission modules *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.

Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the UPSR and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-48 OLIU circuit packs. Ensure that the OC-48 OLIU circuit packs are compatible with each fiber span in the UPSR. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Applications and Planning Guide, 365-372-324*.

4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description*.
5. Review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this upgrade procedure.
6. Determine the local operating procedures for removing a circuit pack/pluggable transmission module. Local operating procedures for removing a circuit pack/pluggable transmission module may vary. One method is to disconnect the optical fibers and remove the circuit pack/pluggable transmission module. Another method is to verify the circuit pack/port active/standby status, perform manual switches if the circuit pack/port is active, and then disconnect the optical fibers and remove the circuit pack/pluggable transmission module.
7. At nodes using multirate circuit packs, select **View** → **Equipment** to access the required circuit pack and verify that the port and port grouping will support the upgrade to the OC-48 rate. Only the first port in the port grouping supports the OC-48 rate. The remaining ports in the port grouping must be unavailable. When the first port in a port group is provisioned to OC-48, the other ports become unavailable. If the OC-12 port to be upgraded is not the first port in the port grouping or other ports in the port grouping are carrying service, the service must be moved before performing this upgrade procedure. To move service to another port pair refer to Procedure 12-5.2: “Upgrade low-speed OC-12 UPSR connections at node with single-rate circuit packs” (p. 12-106). For more information about port groupings, refer to Procedure 4-15: “Install pluggable transmission modules” (p. 4-76).

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-12 UPSR to an OC-48 UPSR.

1 From office records and work instructions, determine the current network configuration. Note how the nodes are connected in the ring and make a drawing of the ring to reference during this upgrade procedure.

2 Log in to a node in the UPSR to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

5 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

6 At each of the remaining nodes in the UPSR, log in to the node and repeat Step 3 through Step 5. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 **NOTICE**

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-5.4: "Verify spanning tree configuration" (p. 12-114)

8 **Important!** The starting node *must* be connected to the OC-12 UPSR using the Main slots. This procedure assumes that the starting node is a Alcatel-Lucent 1665 DMX.

Identify and log in to the Alcatel-Lucent 1665 DMX starting node. (Refer to the "UPSR example" (p. 12-100) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9 If required, verify the active/standby status of the OC-12 OLIU circuit pack/port in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-5.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-112)

10 At the *WaveStar*® CIT System View at the starting node, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-82).

11 **Important!** If Main slot **M2** is to be upgraded with an LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack, the OC-12 OLIU circuit pack in Main slot **M2** *must* be replaced with a temporary replacement OC-48 OLIU circuit pack. (Refer to "Required equipment" (p. 12-83) for a list of acceptable temporary replacement OC-48 OLIU circuit packs.) The temporary replacement OC-48 OLIU circuit pack maintains traffic while slot **M1** and the other nodes in the ring are upgraded. As a final step, this temporary replacement OC-48 OLIU circuit pack is upgraded.

If the circuit pack/port is active for timing and/or transmission, opening the latch or disconnecting fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack/port is upgraded at each end of the optical span.

If Main slot M2 is equipped with a...	Then...
single-rate OC-12 OLIU circuit pack,	Perform the following: 1. Open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M2**. 2. Replace the OC-12 OLIU circuit pack in Main slot **M2** with the temporary replacement OC-48 OLIU circuit pack. **Result:** The temporary replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned. The system reports an `unexpected circuit pack type` *condition* and an `inc. OC12 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If Main slot M2 is equipped with a...	Then...
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a single-rate OC-12 pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-48 and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring. 2. Disconnect the optical fibers from the OC-12 pluggable transmission module in Main slot **M2**. 3. Replace the OC-12 pluggable transmission module in Main slot **M2** with the replacement OC-48 pluggable transmission module. **Result:** The replacement OC-48 pluggable transmission module in Main slot **M2** is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a multirate OC-3/OC-12/OC-48 pluggable transmission module,	Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-48 and click **Apply**. **Result:** The system reports an `inc. OC48 LOF` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

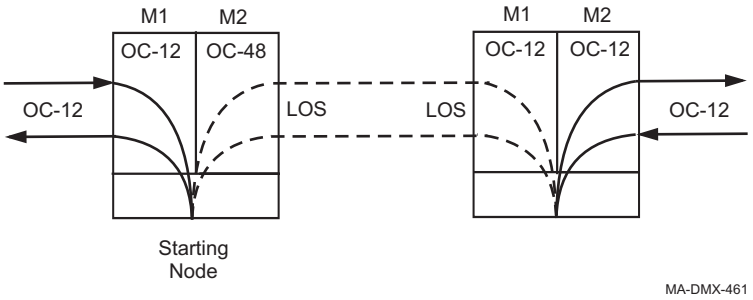
Reference:

- Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

This completes the first phase of the upgrade at the starting node. The starting node upgrade will be completed after all the other nodes in the ring are upgraded.

The following figure shows the state of the starting node and the adjacent optical spans.

Important! If the upgraded OC-48 port in Main slot **M2** at the starting node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



12 Log in to the adjacent node connected to Main/Function/Growth slot 2. (Refer to the "UPSR example" (p. 12-100) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

13 Determine how the node is connected to the UPSR and the type of upgrade circuit pack to be used, and then upgrade the UPSR connections.

If ...	Then upgrade the UPSR connections using...
Alcatel-Lucent 1665 DMX and an LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack is to be used to upgrade Main slot **M1**,	Procedure 12-5.1: "Upgrade high-speed OC-12 UPSR connections at node with single-rate circuit packs" (p. 12-102). Then continue with Step 14.
Alcatel-Lucent 1665 DMX connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	Procedure 12-5.2: "Upgrade low-speed OC-12 UPSR connections at node with single-rate circuit packs" (p. 12-106). Then continue with Step 14.

If ...	Then upgrade the UPSR connections using...
Alcatel-Lucent 1665 DMX connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots,	Procedure 12-5.5: "Upgrade OC-12 UPSR connections at node with multirate circuit packs" (p. 12-118). Then continue with Step 14.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using the circuit packs in the Main slots,	*Procedure 12-4.2: Upgrade high-speed OC-12 UPSR connections at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 14.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using the circuit packs in the Function/Growth slots,	*Procedure 12-4.1: Upgrade low-speed OC-12 UPSR connections at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 14.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using multirate circuit packs in the Main/Function/ Growth slots,	*Procedure 12-4.5: Upgrade OC-12 UPSR connections at node with multirate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 14.

14 Except for the starting node, have all nodes in the UPSR been upgraded?

If...	Then...
No	Repeat Step 12 and Step 13 as required at the next node. (Refer to the "UPSR example" (p. 12-100) at the end of the procedure.)
Yes	Continue with Step 15.

15 Log in to the starting node. (Refer to the "UPSR example" (p. 12-100) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

16

If Main slot M1 is equipped with a...	
single-rate circuit pack,	Proceed to Step 22.

If Main slot M1 is equipped with a...	
multirate circuit pack,	Continue with the next step.

17 If required, verify the active/standby status of the OC-12 port on the multirate circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-5.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-112)

18 Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M1**. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-48 and click **Apply**.

Result:

If the multirate circuit pack in Main slot M1 is equipped with a...	Then...
single-rate OC-12 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1**. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-48 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-48 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-48 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the upgraded OC-48 optical span.

19 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-12 pluggable transmission module in Main slot **M1**. Then replace the single-rate OC-12 pluggable transmission module in Main slot **M1** with the replacement OC-48 pluggable transmission module.

Result: The replacement OC-48 pluggable transmission module in Main slot **M1** is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

20 If required at both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 circuit pack/port in Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

21 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-48 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

STOP! *To complete the upgrade, proceed to* Step 31.

22 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

23 If required, verify the active/standby status of the OC-12 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-5.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-112)

24 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-12 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M1**. Then replace the OC-12 OLIU circuit pack in Main slot **M1** with the replacement OC-48 OLIU circuit pack.

Result: The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

25 If required at both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 OLIU circuit pack in Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The system still reports an `unexpected CP type` *alarm* for Main slot **M1**.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

26



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1.** Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the upgraded optical span between Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the upgraded OC-48 optical span.

27 Open a faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M2**. Then replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-48 OLIU circuit pack.

Result: The replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

28 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

29 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M2**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

30 **Important!** Perform this step only if the opposite end of the upgraded optical span connected to Main slot **M1** is an OC-48 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port.

If required at the opposite end of the upgraded optical span connected to Main slot **M1**, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

31 **Important!** At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

32 At each node connected to the UPSR using single-rate circuit packs in the Function/Growth slots, select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. OC12 LOS` alarms clear on the original OC-12 ports.

33 At each node connected to the UPSR using single-rate circuit packs in the Function/Growth slots, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add and through cross-connections to the original OC-12 ports.

34 **Important!** The network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node cannot be returned to the pre-upgrade state using the backout procedure.

At each node connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

35 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs/port pairs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the UPSR, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

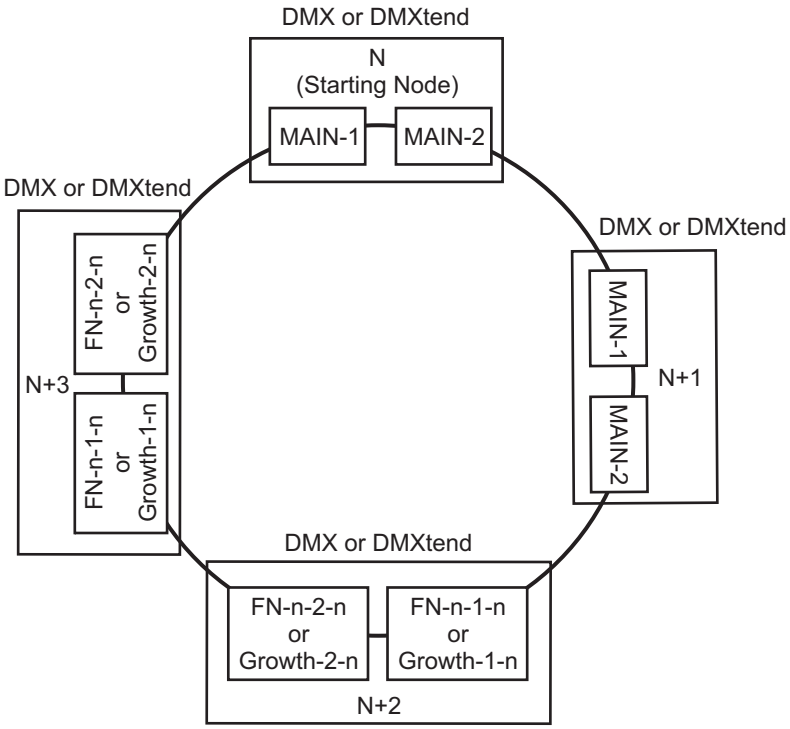
END OF STEPS

UPSR example

Starting Node: Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend connected to the UPSR using the Main Slots (Node N)

Starting Circuit Pack: Main-2 at the Starting Node

Direction of Upgrade: Clockwise around UPSR from Main-2 at the Starting Node to Main/Function/Growth slot 1 at the adjacent node



DMX = 1665 Data Multiplexer
DMXtend = 1665 Data Multiplexer Extend

MA-DMX-404

Procedure 12-5.1: Upgrade high-speed OC-12 UPSR connections at node with single-rate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Complete the following steps to upgrade the in-service high-speed UPSR connections at a Alcatel-Lucent 1665 DMX node using an *incompatible* OC-48 OLIU circuit pack in Main slot **M1**.

1 If required, verify the active/standby status of the OC-12 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-5.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-112)

2 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-82).

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-12 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M1**. Then replace the OC-12 OLIU circuit pack in Main slot **M1** with the replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 If required at both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 circuit pack in Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the upgraded OC-48 optical span, the `inc. OC48 LOS` alarm clears.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1.** Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the upgraded optical span between Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the upgraded OC-48 optical span.

6 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-48 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack/port is upgraded at each end of the optical span.

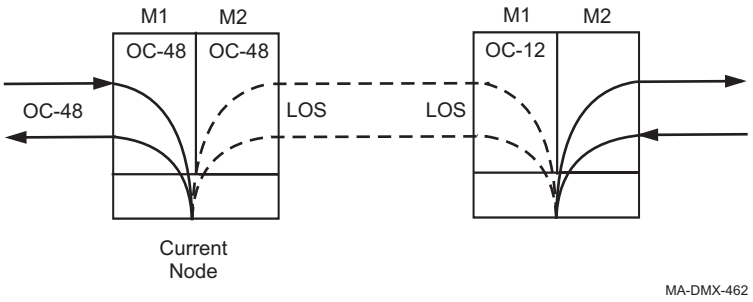
Open a faceplate latch on the OC-12 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M2**. Then replace the OC-12 OLIU circuit pack in Main slot **M2** with the replacement OC-48 OLIU circuit pack.

Result: The replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-5.2: Upgrade low-speed OC-12 UPSR connections at node with single-rate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

When upgrading connections to a UPSR using a port pair on single-rate circuit packs in the Function/Growth slots, the node is *not* required to be in the provisioned Ring Upgrade Mode.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service UPSR connections at a Alcatel-Lucent 1665 DMX node connected to the UPSR using a port pair on single-rate circuit packs in the Function/Growth slots.

1 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the OC-12 ports that are to be upgraded, the Optical Synchronization Source must be reprovisioned to an upgrade OC-48 port or to a different OC-n port not involved in the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

2 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an upgrade OC-48 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the upgrade OC-48 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

3 **Important!** An OC-48 port pair must be available in a different Function/Growth group.

To verify that the upgrade OC-48 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the upgrade OC-48 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

4 To verify that the upgrade OC-48 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the upgrade OC-48 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

5 **Important!** All cross-connections at this node that are associated with the existing OC-12 UPSR must be identified so that traffic can be moved to the OC-48 UPSR.

Select **View** → **Cross-Connections**. Expand the required OC-12 OLIU circuit pack in slot 1 of the Function/Growth group that is currently connected to the OC-12 UPSR. Click on the required OC-12 port and **Select** to obtain the current list of cross-connections. Identify and record all through, add, drop, and UPSR Dual Ring Interworking cross-connections. Click **Close** to exit.

Important! A UPSR Dual Ring Interworking cross-connection consists of a 1-way add, a 1-way through, and a 1-way path protected drop cross-connection. To verify that a cross-connection leg is part of a UPSR Dual Ring Interworking cross-connection, click on the cross-connection leg in the list of cross-connections and click **View Graphic**.

For additional information about UPSR Dual Ring Interworking cross-connections, refer to Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58).

6 For each *UPSR Dual Ring Interworking* cross-connection identified in Step 5, select **Configuration → Cross-Connections** and use the *Cross-Connection Wizard* to delete the UPSR Dual Ring Interworking cross-connections. Then use the *Cross-Connection Wizard* to create the same UPSR Dual Ring Interworking cross-connections on the required OC-48 port pair in the other Function/Growth group.

Result: Transmission hits (less than 60 ms) may occur. Alarms may be reported at other nodes in the ring.

Reference: Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58)

7 **Important!** Do *not* perform this step for a 1-way through cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *through* cross-connection identified in Step 5 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration → Cross-Connections** and use the *Cross-Connection Wizard* to create the same through cross-connections on the required OC-48 port pair in the other Function/Growth group.

Reference: Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)

8 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Disconnect the transmit and receive optical fibers from the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports an `inc. OC12 LOS` alarm for the OC-12 port.

9 If required at both ends of the optical span to be upgraded, perform the following to connect the OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group and the required OC-48 circuit pack/port at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

10 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

11 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-48 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

12 **Important!** Do *not* perform this step for a 1-way add cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *add* cross-connection identified in Step 5 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

13 **Important!** Do *not* perform this step for a 1-way path protected drop cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *drop* cross-connection identified in Step 5 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

14 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

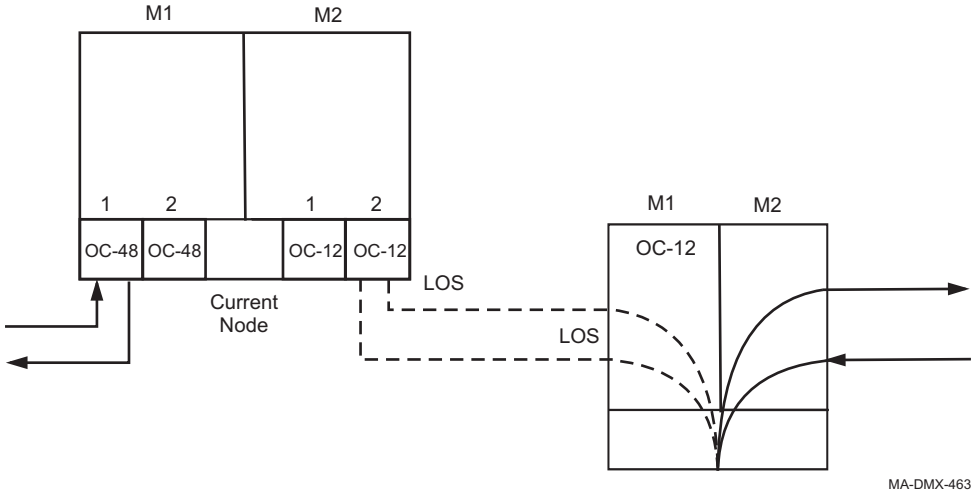
Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack/port is upgraded at each end of the optical span.

Disconnect the transmit and receive optical fibers from the required OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports `inc. OC12 LOS` alarms for the original OC-12 ports. Alarms may also be reported at other nodes in the ring.

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-5.3: Verify active/standby status of circuit pack/port to be upgraded

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack/port to be upgraded and perform manual switches to switch traffic away from an active circuit pack/port.

1 **Important!** If the circuit pack to be upgraded is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be upgraded.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be upgraded is the active circuit pack for timing, an optional manual timing switch can be performed before upgrading the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be upgraded is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be upgraded is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack/port to be upgraded is the active circuit pack/port for transmission and the circuit pack/port is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack/port to be upgraded.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack/port to be upgraded (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack/port to be upgraded). Click **Close**.

5 **Important!** If the circuit pack/port to be upgraded is an active circuit pack for transmission, optional manual switches can be performed before upgrading the circuit pack/port. In UPSRs, each path supported by the circuit pack/port to be upgraded must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack/port to be upgraded is *not* the active circuit pack/port for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack/port to be upgraded. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack/port to be upgraded is *not* the active circuit pack/port for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-5.4: Verify spanning tree configuration

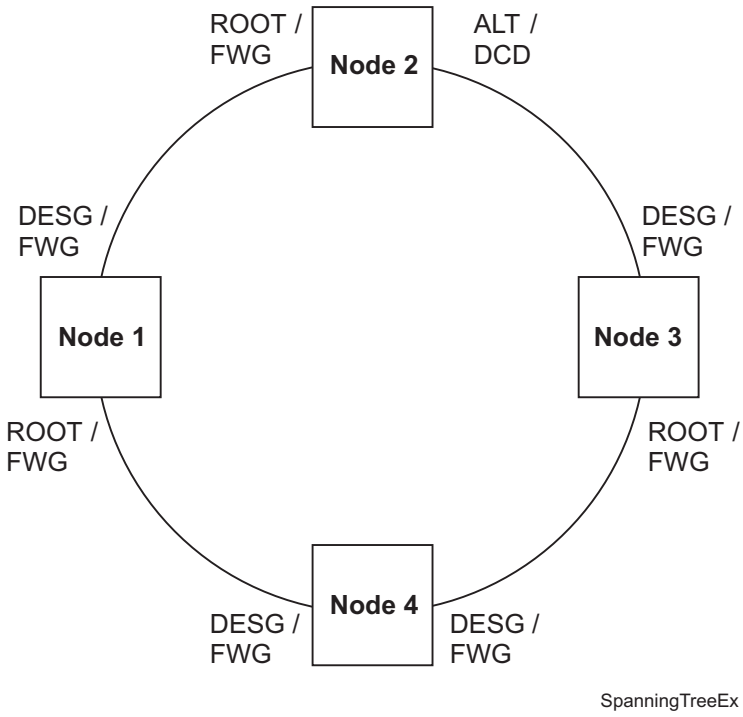
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-114).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If required, change the existing spanning tree configuration.

If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2to verify another spanning tree network.

END OF STEPS

Procedure 12-5.5: Upgrade OC-12 UPSR connections at node with multirate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service UPSR connections at a Alcatel-Lucent 1665 DMX node connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots.

1 **Important!** The Ring Upgrade Mode is required to allow ports in the protected port pair to be independently reprovisioned and operate at different rates.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-82).

2 If required, verify the active/standby status of the OC-12 port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-5.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-112)

3 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-48 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate OC-12 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-48 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-12 LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the upgraded OC-48 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the upgraded OC-48 optical span.

4 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 1. Then replace the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 1 with the replacement OC-48 pluggable transmission module.

Result: The replacement OC-48 pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. OC48 LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 If required at both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 pluggable transmission module in Main/Function/Growth slot 1 and the required circuit pack/port at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the upgraded OC-48 optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

6 **Important!** Perform this step only if the opposite end of the upgraded optical span is an OC-48 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port.

If required at the opposite end of the upgraded optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 If required, verify the active/standby status of the OC-12 port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-5.3: "Verify active/standby status of circuit pack/port to be upgraded" (p. 12-112)

8 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required OC-12 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-48 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate OC-12 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module,	The system reports an `inc. OC48 LOF` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

9 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the circuit pack/port is upgraded at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate OC-12 pluggable transmission module in Main/Function/Growth slot 2 with the replacement OC-48 pluggable transmission module.

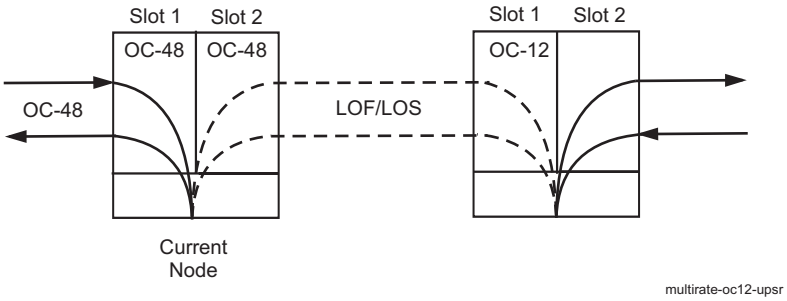
Result: The replacement OC-48 pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. OC48 LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

The following figure shows the state of the current node and the adjacent optical spans.

Important! If the upgraded OC-48 port in Main/Function/Growth slot 2 at the current node is equipped with a single-rate pluggable transmission module, `inc. LOS` alarms are reported. If the upgraded OC-48 port in Main/Function/Growth slot 2 at the current node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-6: Back out OC-12 UPSR to OC-48 UPSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the UPSR using single-rate circuit packs in the Main slots or multirate circuit packs in the Main/Function/Growth slots must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out an OC-12 UPSR to OC-48 upgrade.

Backing out of an upgrade in progress returns *all* nodes in the ring to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-7: “Suspend OC-12 UPSR to OC-48 UPSR upgrade” (p. 12-157).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OC-12 OLIU circuit packs/pluggable transmission modules/port pairs for each node to be backed out
- As the upgrade is backed out around the UPSR, ensure that technicians are available at each end of an optical span as the upgrade is backed out.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description*.
3. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this backout procedure.
4. Determine the local operating procedures for removing a circuit pack/pluggable transmission module. Local operating procedures for removing a circuit pack/pluggable transmission module may vary. One method is to disconnect the optical fibers and remove the circuit pack/pluggable transmission module. Another method is to verify the circuit pack/port active/standby status, perform manual switches if the circuit pack/port is active, and then disconnect the optical fibers and remove the circuit pack/pluggable transmission module.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 UPSR to OC-48 UPSR upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the Alcatel-Lucent 1665 DMX starting node, and the ring upgrade is complete (all nodes connected to the UPSR using single-rate circuit packs in the Main slots or multirate circuit packs in the Main/Function/Growth slots are in the Ring Upgrade Mode),	Log in to the Alcatel-Lucent 1665 DMX starting node (refer to the "UPSR example" (p. 12-135) at the end of the procedure) and continue with Step 3.
not the Alcatel-Lucent 1665 DMX starting node,	Log in to the last node upgraded (refer to the "UPSR example" (p. 12-135) at the end of the procedure) and proceed to Step 7.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 **Important!** If Main slot **M2** of the starting node is equipped with an LNW27, LNW29, LNW32, LNW76, LNW202, and LNW221–259 OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a temporary replacement OC-48 OLIU circuit pack. The temporary replacement OC-48 OLIU circuit pack maintains traffic with the last node to be backed out while the upgrade is backed out at Main slot **M1** and the other nodes in the ring. As a final step, this temporary replacement OC-48 OLIU circuit pack is backed out.

If required, replace the LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M2** of the starting node with a temporary replacement OC-48 OLIU circuit pack.

Reference: Procedure 12-6.4: "Replace incompatible OC-48 OLIU in Main slot M2 of starting node" (p. 12-148)

4 If required, verify the active/standby status of the OC-48 OLIU circuit pack/port in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-6.5: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-150)

5 **Important!** If the circuit pack/port is active for timing and/or transmission, opening the latch or disconnecting fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack/port is backed out at each end of the optical span.

If Main slot M1 is equipped with a...	Then...
single-rate OC-48 OLIU circuit pack,	Perform the following: 1. Open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. 2. Replace the OC-48 OLIU circuit pack in Main slot **M1** with the original OC-12 OLIU circuit pack. **Result:** The original OC-12 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned. The system reports an `unexpected circuit pack type` *condition* and an `inc. OC48 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

If Main slot M1 is equipped with a...	Then...
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a single-rate OC-48 pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M1**. Click on the required OC-48 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring. 2. Disconnect the optical fibers from the OC-48 pluggable transmission module in Main slot **M1**. 3. Replace the OC-48 pluggable transmission module in Main slot **M1** with the original OC-12 pluggable transmission module. **Result:** The original OC-12 pluggable transmission module in Main slot **M1** is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a multirate OC-3/OC-12/OC-48 pluggable transmission module,	Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M1**. Click on the required OC-48 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**. **Result:** The system reports an `inc. OC12 LOF` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

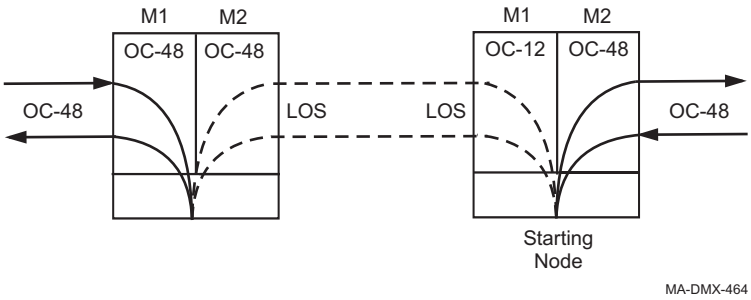
Reference:

- Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

This completes the first phase of the backout at the starting node. The backout at the starting node will be completed after backing out of all the other nodes in the ring.

The following figure shows the state of the starting node and the adjacent optical spans.

Important! If the original OC-12 port in Main slot **M1** at the starting node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



6 Log in to the adjacent node connected to Main/Function/Growth slot 1. (Refer to the "UPSR example" (p. 12-135) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 Determine how the node is connected to the UPSR and back out the upgrade at the node.

If ...	Then back out the UPSR upgrade using...
Alcatel-Lucent 1665 DMX connected to the UPSR using single-rate LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1**,	Procedure 12-6.1: "Back out high-speed UPSR upgrade at node equipped with incompatible OC-48 OLIU in Main slot M1" (p. 12-136). Then continue with Step 8.
Alcatel-Lucent 1665 DMX connected to the UPSR using single-rate LNW26B, LNW28, LNW77, or LNW121B-159 OC-48 OLIU circuit pack in the Main slot **M1**,	Procedure 12-6.2: "Back out high-speed UPSR upgrade at node equipped with compatible OC-48 OLIU in Main slot M1" (p. 12-139). Then continue with Step 8.
Alcatel-Lucent 1665 DMX connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	Procedure 12-6.3: "Back out low-speed OC-12 to OC-48 UPSR upgrade at node with single-rate circuit packs" (p. 12-143). Then continue with Step 8.

If ...	Then back out the UPSR upgrade using...
Alcatel-Lucent 1665 DMX connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots,	Procedure 12-6.6: "Back out OC-12 UPSR to OC-48 UPSR upgrade at node with multirate circuit packs" (p. 12-152). Then continue with Step 8.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using single-rate circuit packs in the Main slots,	*Procedure 12-5.2: Back out high-speed OC-12 UPSR to OC-48 UPSR upgrade at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 8.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using single-rate circuit packs in the Function/Growth slots,	*Procedure 12-5.1: Back out low-speed OC-12 UPSR to OC-48 UPSR upgrade at node with single-rate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 8.
Alcatel-Lucent 1665 DMXtend connected to the UPSR using multirate circuit packs in the Main/Function/ Growth slots,	*Procedure 12-5.4: Back out OC-12 UPSR to OC-48 UPSR upgrade at node with multirate circuit packs* in *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*. Then continue with Step 8.

8 Except for the starting node, has the upgrade been backed out of all nodes in the UPSR?

If...	Then...
No,	Repeat Step 6 and Step 7, as required, at the next node. (Refer to the "UPSR example" (p. 12-135) at the end of the procedure.)
Yes,	Continue with Step 9.

9 Log in to the starting node. (Refer to the "UPSR example" (p. 12-135) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

10 **Important!** The **UPD/INIT** button does not work during this procedure.

If the starting node is equipped with...	

single-rate circuit packs,	At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**. **Result:** A dialog box appears asking you to confirm executing this command. Click **Yes**. The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M2**. Continue with the next step.
multirate circuit packs,	Continue with the next step.

11 If required, verify the active/standby status of the OC-48 OLIU circuit pack/port in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-6.5: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-150)

12 **Important!** If the circuit pack/port is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If Main slot M2 is equipped with a...	Then...
single-rate OC-12 OLIU circuit pack,	Perform the following: 1. Open a faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. 2. Replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack. **Result:** The original OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned. The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If Main slot M2 is equipped with a...	Then...
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a single-rate OC-12 pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-48 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring. 2. Disconnect the optical fibers from the OC-48 pluggable transmission module in Main slot **M2**. 3. Replace the OC-48 pluggable transmission module in Main slot **M2** with the original OC-12 pluggable transmission module. **Result:** The original OC-12 pluggable transmission module in Main slot **M2** is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main slot **M2** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.
LNW82 multirate OC-3/OC-12/OC-48 OLIU circuit pack with a multirate OC-3/OC-12/OC-48 pluggable transmission module,	Select **Configuration** → **Equipment** and expand the circuit pack in Main slot **M2**. Click on the required OC-48 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**. **Result:** The system may report an `inc. OC12 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Reference:

- Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

13 If required at both ends of the optical span to be backed out, perform the following to connect the original OC-12 circuit pack in Main slot **M2** and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the original OC-12 optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

14 **Important!** Perform this step only if the opposite end of the original optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-12 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

15 **Important!** At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

16 **Important!** This completes the backout procedure, except for taking the nodes connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots out of the Ring Upgrade Mode. The decision to take these nodes out of the Ring Upgrade Mode or leave them depends on the reason the back out was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, UPSR cross-connections cannot be created or removed.

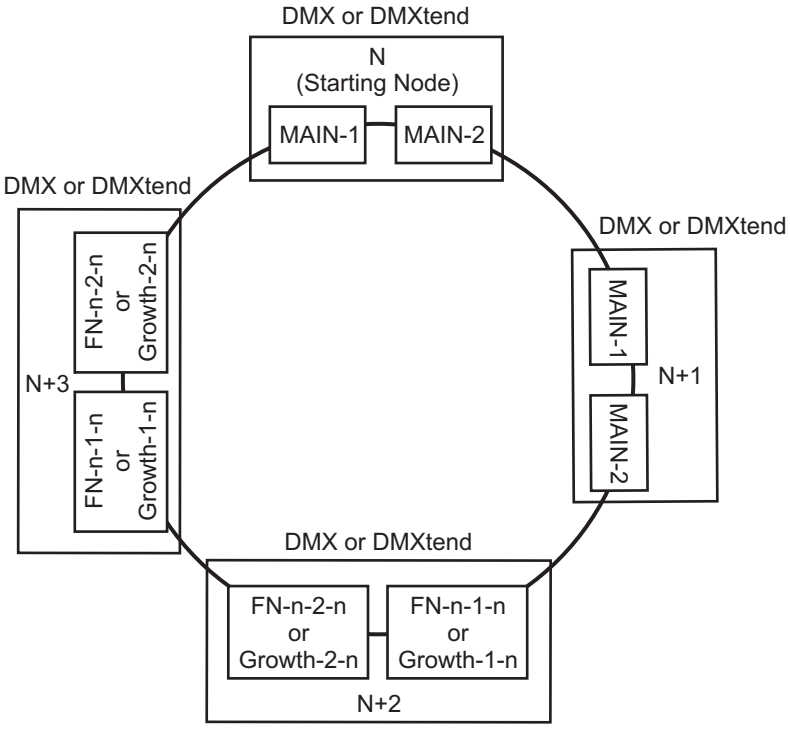
If required at each node connected to the UPSR using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

UPSR example



DMX = 1665 Data Multiplexer
DMXtend = 1665 Data Multiplexer Extend

MA-DMX-404

Procedure 12-6.1: Back out high-speed UPSR upgrade at node equipped with incompatible OC-48 OLIU in Main slot M1

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Incompatible OC-48 OLIU circuit packs include LNW27, LNW29, LNW32, LNW76, LNW202, and LNW221–259 OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 UPSR to OC-48 UPSR upgrade at a Alcatel-Lucent 1665 DMX node equipped with an *incompatible* OC-48 OLIU circuit pack in Main slot **M1**.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with OC-48 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been upgraded with an OC-48 OLIU circuit pack,	Proceed to Step 5.

2 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-6.5: “Verify active/standby status of circuit pack/port to be backed out” (p. 12-150)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 If required at both ends of the optical span to be backed out, perform the following to connect the original OC-12 OLIU circuit pack in Main slot **M2** and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the original OC-12 optical span, the `inc. OC12 LOS` alarm clears.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the original optical span between Main slot **M2** and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span.

6 **Important!** Perform this step only if the opposite end of the original optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-12 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack/port is backed out at each end of the optical span.

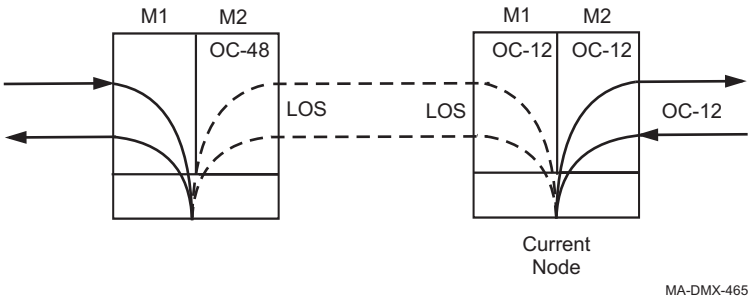
Open a faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the original OC-12 OLIU circuit pack.

Result: The original OC-12 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-6.2: Back out high-speed UPSR upgrade at node equipped with compatible OC-48 OLIU in Main slot M1

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Compatible OC-48 OLIU circuit packs include the LNW26B, LNW28, LNW77, and LNW121B–159B OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 UPSR to OC-48 UPSR upgrade at a Alcatel-Lucent 1665 DMX node equipped with a *compatible* OC-48 OLIU circuit pack in the Main slot **M1**.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with OC-48 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been upgraded with an OC-48 OLIU circuit pack,	Proceed to Step 6.

2 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-6.5: “Verify active/standby status of circuit pack/port to be backed out” (p. 12-150)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The original OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` *condition* and an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 If required at both ends of the optical span to be backed out, perform the following to connect the original OC-12 circuit pack in Main slot **M2** and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-12 optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 **Important!** Perform this step only if the opposite end of the original optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-12 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

7 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-6.5: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-150)

8 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack/port is backed out at each end of the optical span.

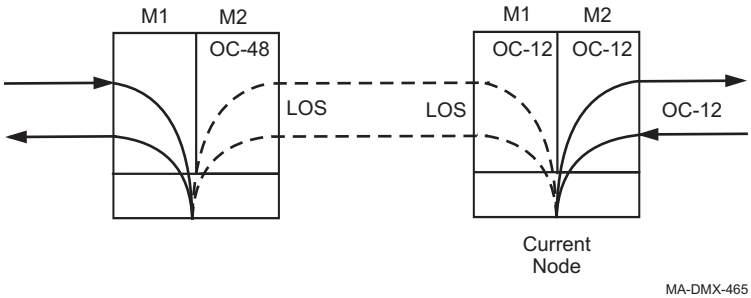
Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the original OC-12 OLIU circuit pack.

Result: The original OC-12 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-6.3: Back out low-speed OC-12 to OC-48 UPSR upgrade at node with single-rate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure assumes that the Alcatel-Lucent 1665 DMX node is still equipped with the original OC-12 OLIU circuit packs/pluggable transmission modules.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 UPSR to OC-48 UPSR upgrade at a Alcatel-Lucent 1665 DMX node connected to the UPSR using a port pair on single-rate circuit packs in the Function/Growth slots.

1 Determine the current status of the upgrade at the node.

If the port in...	Then...
both Function/Growth slot 1 and 2 have been upgraded to OC-48 ports,	Continue with Step 2.
only Function/Growth slot 1 has been upgraded to an OC-48 port,	Proceed to Step 14.

2 To verify that the original OC-12 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the original OC-12 port pair according to the office records using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

3 To verify that the original OC-12 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the original OC-12 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

4 **Important!** All cross-connections at this node that are associated with the OC-48 UPSR must be identified so that traffic can be moved back to the original OC-12 UPSR.

Select **View** → **Cross-Connections**. Expand the required OC-48 OLIU circuit pack in slot 2 of the Function/Growth group that is currently connected to the UPSR. Click on the required OC-48 port and **Select** to obtain the current list of cross-connections. Identify and record all through, add, drop, and UPSR Dual Ring Interworking cross-connections. Click **Close** to exit.

Important! A UPSR Dual Ring Interworking cross-connection consists of a 1-way add, a 1-way through, and a 1-way path protected drop cross-connection. To verify that a cross-connection leg is part of a UPSR Dual Ring Interworking cross-connection, click on the cross-connection leg in the list of cross-connections and click **View Graphic**.

For additional information about UPSR Dual Ring Interworking cross-connections, refer to Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58).

5 Repeat Step 4 to obtain a current list of cross-connections for the original OC-12 port in slot 2 of the other Function/Growth group. Compare the original OC-12 port cross-connection list with the upgrade OC-48 port cross-connection list.

6 For each *UPSR Dual Ring Interworking* cross-connection identified in Step 4, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the UPSR Dual Ring Interworking cross-connections. Then use the *Cross-Connection Wizard* to create the same UPSR Dual Ring Interworking cross-connections on the original OC-12 port pair in the other Function/Growth group.

Result: Transmission hits (less than 60 ms) may occur. Alarms may be reported at other nodes in the ring.

Reference: Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58)

7 **Important!** Do *not* perform this step for a 1-way through cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *through* cross-connection identified in Step 4 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to create the same through cross-connections on the original OC-12 port pair in the other Function/Growth group.

Reference: Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)

8



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Disconnect the transmit and receive optical fibers from the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports an `inc. OC48 LOS` alarm for the OC-48 port.

9 If required at both ends of the optical span to be backed out, perform the following to connect the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

10 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

11 **Important!** Perform this step only if the opposite end of the original optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-12 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

12 **Important!** Do *not* perform this step for a 1-way add cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *add* cross-connection identified in Step 4 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

13 **Important!** Do *not* perform this step for a 1-way path protected drop cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *drop* cross-connection identified in Step 4 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

14 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack/port is backed out at each end of the optical span.

Disconnect the transmit and receive optical fibers from the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports `inc. LOS` alarms for the upgrade OC-48 ports and the original OC-12 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group. Alarms may also be reported at other nodes in the ring.

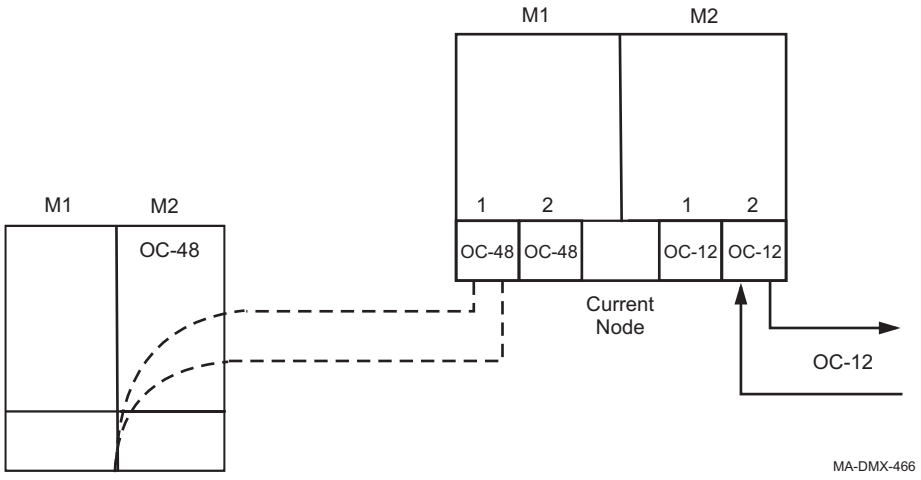
15 Select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. LOS` alarms clear.

16 Select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add and through cross-connections to the upgrade OC-48 ports.

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-6.4: Replace incompatible OC-48 OLIU in Main slot M2 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to replace the LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M2** of the starting node with a temporary replacement OC-48 OLIU circuit pack.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-6.5: “Verify active/standby status of circuit pack/port to be backed out” (p. 12-150)

2 **Important!** Acceptable temporary replacement OC-48 OLIU circuit packs include the LNW26B, LNW28, LNW77, and LNW121B–159B OC-48 OLIU circuit packs. For more information, refer to Procedure 12-5: “Upgrade OC-12 UPSR to OC-48 UPSR” (p. 12-81).

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M2**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-6.5: Verify active/standby status of circuit pack/port to be backed out

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack/port to be backed out and perform manual switches to switch traffic away from an active circuit pack/port .

1 **Important!** If the circuit pack to be backed out is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be backed out.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be backed out is the active circuit pack for timing, an optional manual timing switch can be performed before backing out the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be backed out is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be backed out is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack/port to be backed out is the active circuit pack for transmission and the circuit pack/port is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack/port to be backed out.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack/port to be backed out (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack/port to be backed out). Click **Close**.

5 **Important!** If the circuit pack/port to be backed out is an active circuit pack/port for transmission, optional manual switches can be performed before backing out the circuit pack/port . In UPSRs, each path supported by the circuit pack/port to be backed out must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack/port to be backed out is *not* the active circuit pack/port for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack/port to be backed out. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack/port to be backed out is *not* the active circuit pack/port for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-6.6: Back out OC-12 UPSR to OC-48 UPSR upgrade at node with multirate circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 UPSR to OC-48 UPSR upgrade at an Alcatel-Lucent 1665 DMX node connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots.

1 Determine the current status of the upgrade at the node.

If the pluggable transmission module in...	Then...
both Main/Function/Growth slots have been upgraded,	Continue with Step 2.
only Main/Function/Growth slot 1 has been upgraded,	Proceed to Step 7.

2 If required, verify the active/standby status of the OC-48 port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-6.5: “Verify active/standby status of circuit pack/port to be backed out” (p. 12-150)

3 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required OC-48 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate OC-48 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the original OC-12 span is equipped with a single-rate circuit pack/pluggable transmission module,	The system reports an `inc. OC-12 LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module and the opposite end of the original OC-12 span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the original OC-12 optical span.

4 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-48 pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate OC-48 pluggable transmission module in Main/Function/Growth slot 2 with the original OC-12 pluggable transmission module.

Result: The original OC-12 pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. OC12 LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

5 If required at both ends of the optical span to be upgraded, perform the following to connect the original OC-12 pluggable transmission module in Main/Function/Growth slot 2 and the required circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the original OC-12 optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

6 **Important!** Perform this step only if the opposite end of the original optical span is an OC-12 port in a Function/Growth group and the Optical Synchronization Source is to be reprovisioned to the original OC-12 port.

If required at the opposite end of the original optical span, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 If required, verify the active/standby status of the OC-48 port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active circuit pack/port.

Reference: Procedure 12-6.5: "Verify active/standby status of circuit pack/port to be backed out" (p. 12-150)

8 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required OC-48 port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to OC-12 and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate OC-48 pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.
multirate OC-3/OC-12/OC-48 pluggable transmission module,	The system reports an `inc. OC12 LOF` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.

9 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the circuit pack/port is backed out at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate OC-48 pluggable transmission module in Main/Function/Growth slot 1. Then replace the single-rate OC-48 pluggable transmission module in Main/Function/Growth slot 1 with the original OC-12 pluggable transmission module.

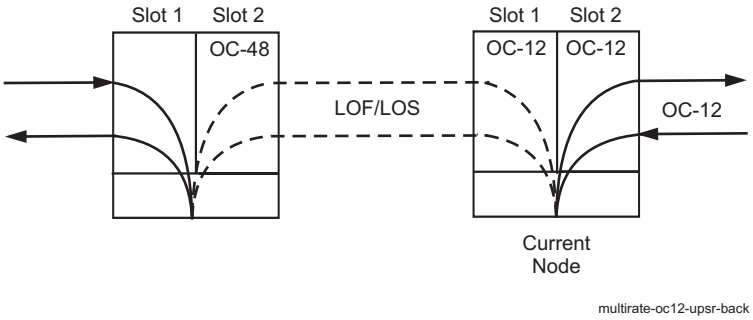
Result: The original OC-12 pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. OC12 LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

The following figure shows the state of the current node and the adjacent optical spans.

Important! If the original OC-12 port in Main/Function/Growth slot 1 at the current node is equipped with a single-rate pluggable transmission module, `inc. LOS` alarms are reported. If the original OC-12 port in Main/Function/Growth slot 1 at the current node is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-7: Suspend OC-12 UPSR to OC-48 UPSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the UPSR using the Main slots must be in the provisioned Ring Upgrade Mode.

> **Important!** This procedure starts at the last node upgraded. The last node upgraded must be connected to the UPSR using the Main slots. Suspending an upgrade at a node connected to the UPSR using port pairs in the Function/Growth slots is *not* supported.
>
> This procedure assumes that the last node upgraded is a Alcatel-Lucent 1665 DMX. However, the Alcatel-Lucent 1665 DMXtend can also be connected to a UPSR using the Main slots. If the upgrade is suspended at a Alcatel-Lucent 1665 DMXtend node, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*, *Procedure 12-6: Suspend OC-12 UPSR to OC-48 UPSR upgrade*.

Use this procedure to temporarily suspend an OC-12 UPSR to OC-48 UPSR upgrade at a Alcatel-Lucent 1665 DMX node connected to the UPSR using single-rate circuit packs.

To temporarily stop the upgrade at a Alcatel-Lucent 1665 DMX node connected to the UPSR using multirate circuit packs in the Main/Function/Growth slots, refer to Procedure 12-37: “Suspend UPSR/1+1 upgrade at node (multirate circuit packs)” (p. 12-679).

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the ring to their pre-upgrade state, refer to Procedure 12-6: “Back out OC-12 UPSR to OC-48 UPSR upgrade” (p. 12-123).

When the ring upgrade is temporarily suspended before completion, some spans are operating at the OC-12 line rate and some at the OC-48 line rate. This requires two nodes that are equipped with an OC-12 OLIU circuit pack in one Main slot and an OC-48 OLIU circuit pack in the other Main slot. These nodes are the starting node and the last node upgraded. These nodes must be connected to the UPSR using the Main slots. Suspending an upgrade at a node connected to the UPSR using port pairs in the Function/Growth slots is *not* supported.

To continue to operate temporarily with different circuit packs in the Main slots, the starting node and the nodes that have been upgraded must remain in the Ring Upgrade Mode.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- One original OC-12 OLIU circuit pack if the upgrade is suspended at a node where both Main slots are equipped with LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit packs
- One LNW26B OC-48 OLIU circuit packs (temporarily required if the upgrade is suspended at a node equipped with an LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack)

  The LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit packs may also be used as the temporary replacement circuit packs. However, the temporary replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long range optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.

Steps

Important! This procedure starts at the last node upgraded. This procedure assumes that the last node upgraded is a Alcatel-Lucent 1665 DMX.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to temporarily suspend an OC-12 to OC-48 UPSR upgrade at a Alcatel-Lucent 1665 DMX.

1 Identify the last node that was upgraded.

If...	Then log in to the...
both Main slots have been upgraded with LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit packs,	last node upgraded (refer to the "UPSR example" (p. 12-170) at the end of the procedure) and continue with Step 2.
both Main slots have been upgraded with LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit packs,	last node upgraded (refer to the "UPSR example" (p. 12-170) at the end of the procedure) and proceed to Step 11.
one Main slot has been upgraded with an LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack,	last node upgraded (refer to the "UPSR example" (p. 12-170) at the end of the procedure) and proceed to Step 17.
one Main slot has been upgraded with an LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit pack,	last node upgraded (refer to the "UPSR example" (p. 12-170) at the end of the procedure) and proceed to Step 28.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 **Important!** Both Main slots have been upgraded with LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit packs. The **Configuration** → **Update System** → **Upgrade** command has been performed and all traffic is now active on Main slot **M1**. The system is reporting an `inc. OC48 LOS` alarm for Main slot **M2**.

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the OC-48 OLIU circuit pack in Main slot **M2**.

If the local operating procedures specify...	Then...
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 6.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 3.

3 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the OC-48 OLIU circuit pack in Main slot **M2**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

4 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

5 If required, repeat Step 3 to verify that the circuit pack in Main slot **M1** is now the active circuit pack for timing.

6 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The `inc. OC48 LOS` alarm for Main slot **M2** clears, and system reports an `unexpected CP type` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

7 At both ends of the optical span, perform the following to connect the original OC-12 OLIU circuit pack in Main slot **M2** and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**.

9 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with a temporary replacement OC-48 OLIU circuit pack.

Result: The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M1** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC12 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 At both ends of the optical span, perform the following to connect the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC12 LOS` alarm for Main slot **M1** clears, and the system still reports an `unexpected circuit pack type` condition for Main slot **M1**.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the upgrade OC-48 OLIU circuit pack, perform a system update, and replace the OC-12 OLIU circuit pack in Main slot **M2** with the upgrade OC-48 OLIU circuit pack. Refer to Procedure 12-5: "Upgrade OC-12 UPSR to OC-48 UPSR" (p. 12-81).

To back out the upgrade, refer to Procedure 12-6: "Back out OC-12 UPSR to OC-48 UPSR upgrade" (p. 12-123).

11 **Important!** Both Main slots have been upgraded with LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit packs. The **Configuration** → **Update System** → **Upgrade** command has been performed and all traffic is now active on Main slot M1. The system is reporting an `inc. OC48 LOS` alarm for Main slot **M2**.

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the OC-48 OLIU circuit pack in Main slot **M2**.

If the local operating procedures specify…	Then…
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 15.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 12.

12 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the OC-48 OLIU circuit pack in Main slot **M2**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

13 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

14 If required, repeat Step 12 to verify that the circuit pack in Main slot **M1** is now the active circuit pack for timing.

15 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` condition and an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

16 At both ends of the optical span, perform the following to connect the original OC-12 OLIU circuit pack in Main slot **M2** and the required OC-12 circuit pack/port at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm for Main slot **M2** clears, and the system still reports an `unexpected circuit pack type` condition for Main slot **M2**.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the OC-12 OLIU circuit pack in Main slot **M2** with the upgrade OC-48 OLIU circuit pack. Refer to Procedure 12-5: “Upgrade OC-12 UPSR to OC-48 UPSR” (p. 12-81).

To back out the upgrade, refer to Procedure 12-6: “Back out OC-12 UPSR to OC-48 UPSR upgrade” (p. 12-123).

17 **Important!** Main slot **M1** has been upgraded with an LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack. The **Configuration** → **Update System** → **Upgrade** command has been performed and all traffic is now active on Main slot **M1**.

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the OC-48 OLIU circuit pack in Main slot **M1**.

If the local operating procedures specify…	Then…
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 25.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 18.

18 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the OC-48 OLIU circuit pack in Main slot **M1**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

19 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M1**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-12 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

20 If required, repeat Step 18 to verify that the circuit pack in Main slot **M2** is now the active circuit pack for timing.

21 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the OC-48 OLIU circuit pack in Main slot **M1**.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m1-()-()* paths supported by the circuit pack in Main slot **M1** (*Ring 1*). Record the active paths supported by the circuit pack in Main slot **M1** (*Ring 1*). Click **Close**.

22 **Important!** This step is optional. If the OC-48 OLIU circuit pack in Main slot **M1** is an active circuit pack for transmission, optional manual switches can be performed before replacing the circuit pack in Main slot **M1**. In UPSRs, each path supported by the circuit pack in Main slot **M1** must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-48 OLIU circuit pack in Main slot **M1** is *not* the active circuit pack for transmission, proceed to Step 24.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

23 Repeat Step 22 for each path supported by the circuit pack in Main slot **M1**. Click **Close**.

24 If required, repeat Step 21 to verify that the circuit pack in Main slot **M2** is now the active circuit pack for transmission.

25 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

26 At both ends of the optical span, perform the following to connect the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

27 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M2**.

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the upgrade OC-48 OLIU circuit pack, perform a system update, and replace the OC-12 OLIU circuit pack in Main slot **M2** with the upgrade OC-48 OLIU circuit pack. Refer to Procedure 12-5: "Upgrade OC-12 UPSR to OC-48 UPSR" (p. 12-81).

To back out the upgrade, refer to Procedure 12-6: "Back out OC-12 UPSR to OC-48 UPSR upgrade" (p. 12-123).

28 **Important!** Main slot **M1** has been upgraded with an LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit pack.

If an `unexpected circuit pack type` condition is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, the node is already in the proper suspend configuration and no further action is required.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M2**.

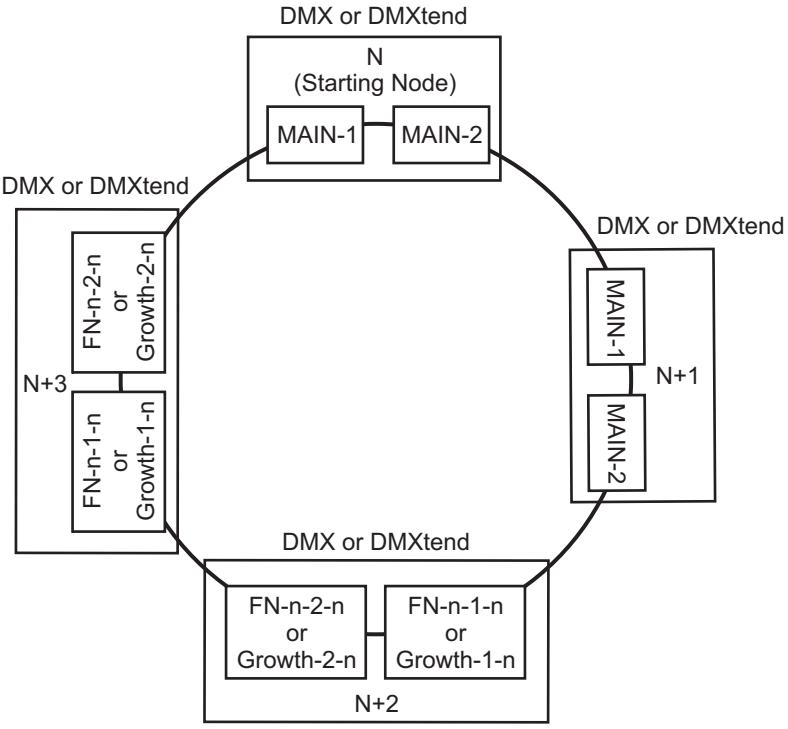
STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the OC-12 OLIU circuit pack in Main slot **M2** with the OC-48 OLIU circuit pack. Refer to Procedure 12-5: “Upgrade OC-12 UPSR to OC-48 UPSR” (p. 12-81).

To back out the upgrade, refer to Procedure 12-6: “Back out OC-12 UPSR to OC-48 UPSR upgrade” (p. 12-123).

END OF STEPS

UPSR example



DMX = 1665 Data Multiplexer
DMXtend = 1665 Data Multiplexer Extend

MA-DMX-404

Procedure 12-8: Upgrade OC-48 UPSR to OC-192 UPSR

Overview

Important! The UPSR must be equipped with Alcatel-Lucent 1665 DMX nodes only. This upgrade procedure does *not* support upgrading UPSRs equipped with nodes other than Alcatel-Lucent 1665 DMX.

Use this procedure to upgrade an in-service OC-48 UPSR to a OC-192 UPSR. The supported upgrades include non-VLF to non-VLF upgrades and VLF to VLF upgrades.

Note: To upgrade an in-service non-VLF OC-48 UPSR to a VLF OC-192 UPSR, refer to Procedure 12-19: "Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR" (p. 12-395).

The OC-48 OLIU circuit packs in the Main slots are upgraded at each node. This procedure assumes that in the UPSR, the circuit pack in Main slot **M1** is always connected to the circuit pack in Main slot **M2** of the adjacent node. (Refer to the "UPSR example" (p. 12-184) at the end of the procedure.)

Important! Transmission hits occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Ring Upgrade Mode

During the upgrade, each node connected to the UPSR using the Main slots must be provisioned in the Ring Upgrade Mode. The Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack and prohibits the following operations:

- Software upgrades to the node (**APPLY**, **INS-PRGM**)
- Cross-connection provisioning (**ENT-CRS**, **DLT-CRS**)
- Manual equipment protection switching of the Function/Growth slots (**SW-TOPROTN**, **SW-TOWKG**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded ring, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Compatible and incompatible OC-48 OLIU circuit packs

The original OC-48 OLIU and replacement OC-192 OLIU circuit packs have compatible or incompatible VT cross-connection fabrics.

Compatible OC-48 OLIU circuit packs

Compatible OC-48 OLIU circuit packs and the replacement OC-192 OLIU circuit packs have *compatible* VT cross-connection fabrics. During the upgrade when one Main slot is equipped with a compatible OC-48 OLIU circuit pack and the companion Main slot is equipped with a replacement OC-192 OLIU circuit pack, all add/drop and through traffic is supported. The system reports an `unexpected circuit pack type` *condition*, and the affected circuit pack is not failed.

The following OC-48 OLIU circuit packs are compatible with the replacement OC-192 OLIU circuit packs:

- LNW27 (Series 1:6 and later)
- LNW29 (Series 1:6 and later)
- LNW32
- LNW76 (Series 1:6 and later)
- LNW82
- LNW202
- LNW221–259 (Series 1:6 and later)

These OC-48 OLIU circuit packs have different optics and transmit wavelengths. However, these circuit packs are functionally and electrically the same. There are no differences between these circuit packs for the purposes of ring upgrades.

Refer to "Required equipment" (p. 12-174) for a complete list of supported replacement OC-192 OLIU circuit packs.

Incompatible OC-48 OLIU circuit packs

Incompatible OC-48 OLIU circuit packs and the replacement OC-192 OLIU circuit packs have *incompatible* VT cross-connection fabrics. During the upgrade when one Main slot is equipped with an incompatible OC-48 OLIU circuit pack and the companion Main slot is equipped with a replacement OC-192 OLIU circuit pack, VT pass-through transmission is not supported. The system reports an `unexpected CP type` *alarm*, and the affected circuit pack is failed.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

The following OC-48 OLIU circuit packs are incompatible with the replacement OC-192 OLIU circuit packs:

- LNW26B
- LNW27 (pre Series 1:6)
- LNW28
- LNW29 (pre Series 1:6)
- LNW76 (pre Series 1:6)
- LNW77
- LNW121B–159B
- LNW221–259 (pre Series 1:6)

These OC-48 OLIU circuit packs have different optics and transmit wavelengths. However, these circuit packs are functionally and electrically the same. There are no differences between these circuit packs for the purposes of ring upgrades.

Refer to "Required equipment" (p. 12-174) for a complete list of supported replacement OC-192 OLIU circuit packs.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, "System configuration procedures".

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.

If the Remote NE Status parameter is...	Then...
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- The following lightguide buildouts (LBOs) should be available:
  - 5-dB loss LBO (code ABLCS-05.0: comcode 108279381)
  - 10-dB loss LBO (code ABLCS-10.0: comcode 108279431)
  - 15-dB loss LBO (code ABLCS-15.0: comcode 108279480)
- Lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269)
- As optical spans are upgraded around the UPSR, ensure that technicians are available at each end of an optical span as it is upgraded.
- If Main slot **M1** at the first node to be upgraded is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack, *one* Series 1:6 or later version of the same OC-48 OLIU circuit pack type, is temporarily required. For example if the first node to be upgraded is equipped with pre Series 1:6 LNW27 OC-48 OLIU circuit packs, then a Series 1:6 or later LNW27 OC-48 OLIU circuit pack is temporarily required.
- If Main slot **M1** at the first node to be upgraded is equipped with an LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit pack, *one* LNW27 (Series 1:6 and later) or LNWUPG OC-48 OLIU circuit pack is temporarily required.

The LNWUPG OC-48 OLIU circuit pack is a special LNW27 OC-48 OLIU circuit pack that is intended for use only as the temporary transition circuit pack during ring upgrades. There are no differences between the LNW27 (Series 1:6 and later) and LNWUPG circuit packs with respect to in-service upgrades.

An LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack may also be used as the temporary replacement circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.

- 2 replacement LNW56, LNW57, LNW58, LNW60, LNW502, LNW523, LNW527, LNW554, or LNW555 OC-192 OLIU circuit packs (Series 1:1 and later) for each node.

  To upgrade an in-service UPSR using the Very Large Fabric (VLF) LNW59 or LNW504 circuit packs, refer to Procedure 12-19: “Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR” (p. 12-395).

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.

  Important! Release 2.1.2 or later software is required to support the OC-192 OLIU circuit packs.

  Release 3.0 or later software is required to support LNW555 OC-192 OLIU circuit packs.

  Release 4.0 or later software is required to support LNW57, LNW523, LNW527, and LNW554 OC-192 OLIU circuit packs.

  Release 5.1 or later software is required to support LNW60 OC-192 OLIU circuit packs.

  Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the UPSR and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-192 OLIU circuit packs. Ensure that the OC-192 OLIU circuit packs are compatible with each fiber span in the UPSR. Attenuation and Dispersion may be limiting factors at longer span lengths.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.
5. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-48 UPSR to an OC-192 UPSR.

1 From office records and work instructions, determine the current network configuration. Note how the nodes are connected in the ring and make a drawing of the ring to reference during this upgrade procedure.

2 Log in to a node in the UPSR to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

5 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

6 At each of the remaining nodes in the UPSR, log in to the node and repeat Step 3 through Step 5. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 

NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-8.6: "Verify spanning tree configuration" (p. 12-204)

8 Identify and log in to the starting node. (Refer to the "UPSR example" (p. 12-184) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9 Determine the OC-48 OLIU circuit pack types installed in the Main slots of the starting node using **Reports** → **Equipment Lists** → **Packs**. Click *Shelf* and **Select**. Observe the *Apparatus Code* and *Series Number* of the *main-1* and *main-2* circuit packs. Click **Close**.

10 **Important!** If Main slot **M1** of the starting node is equipped with a pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type. The Series 1:6 or later OC-48 OLIU circuit pack maintains traffic

with the last node to be upgraded while Main slot **M2** and the other nodes in the ring are upgraded. As a final step, the Series 1:6 or later OC-48 OLIU circuit pack is upgraded.

If required, replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Reference: Procedure 12-8.1: "Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node" (p. 12-186)

11 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View at the starting node, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-171).

12 **Important!** If Main slot **M1** of the starting node is equipped with an LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a temporary replacement OC-48 OLIU circuit pack. (Refer to "Required equipment" (p. 12-174) for a list of acceptable temporary replacement OC-48 OLIU circuit packs.) The temporary replacement OC-48 OLIU circuit pack maintains traffic with the last node to be upgraded while Main slot **M2** and the other nodes in the ring are upgraded. As a final step, this temporary replacement OC-48 OLIU circuit pack is upgraded.

If required, replace the LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a temporary replacement OC-48 OLIU circuit pack.

Reference: Procedure 12-8.2: "Replace LNW26B, 28, 77, 121B-159B OC-48 OLIU in Main slot M1 of starting node" (p. 12-188)

13 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack..

Reference: Procedure 12-8.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-202)

14

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

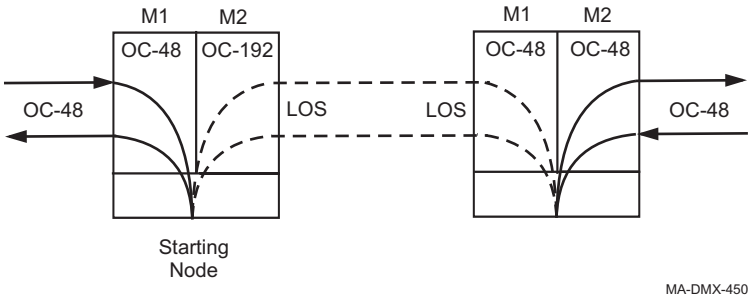
The system reports an `unexpected circuit pack type` *condition* and an `OC48 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

This completes the first phase of the UPSR upgrade at the starting node. The starting node upgrade will be completed after all the other nodes in the ring are upgraded.

The following figure shows the state of the starting node and the adjacent optical spans.



15 Log in to the adjacent node connected to Main slot **M2**. (Refer to the "UPSR example" (p. 12-184) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

16 Determine the OC-48 OLIU circuit pack types installed in the Main slots using **Reports** → **Equipment Lists** → **Packs**. Click *Shelf* and **Select**. Observe the *Apparatus Code* and *Series Number* of the *main-1* and *main-2* circuit packs. Click **Close**.

17

If Main slot M2 is equipped with an...	Then upgrade the high-speed UPSR connections using...
LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack,	Procedure 12-8.3: "Upgrade high-speed UPSR connections at node equipped with incompatible OC-48 OLIU in Main slot M2" (p. 12-191). Then continue with Step 18.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack,	Procedure 12-8.4: "Upgrade high-speed UPSR connections at node equipped with compatible OC-48 OLIU in Main slot M2" (p. 12-195). Then continue with Step 18.

Refer to "Compatible and incompatible OC-48 OLIU circuit packs" (p. 12-172) for more information about compatible and incompatible OC-48 OLIU circuit packs.

18 Except for the starting node, have all nodes in the UPSR been upgraded?

If...	Then...
No	Repeat Step 15 through Step 17 as required at the next node. (Refer to the "UPSR example" (p. 12-184) at the end of the procedure.)
Yes	Continue with Step 19.

19 Log in to the starting node. (Refer to the "UPSR example" (p. 12-184) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

20 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

21 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-8.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-202)

22 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

23 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-192 OLIU circuit pack in Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

24 **Important!** At each node in the UPSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the UPSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

25 **Important!** The network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node cannot be returned to the pre-upgrade state using the backout procedure.

At each node in the UPSR, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

26 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the UPSR, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

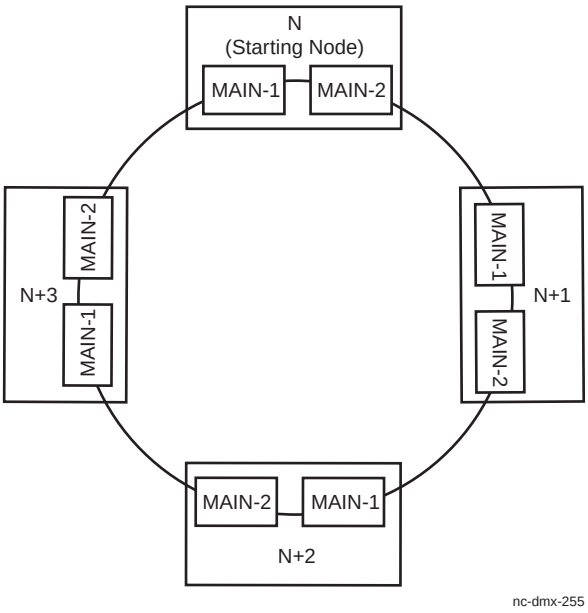
END OF STEPS

UPSR example

Starting Node: Alcatel-Lucent 1665 DMX Node N

Starting Circuit Pack: Main-2 at the Starting Node

Direction of Upgrade: Clockwise around UPSR from Main-2 at the Starting Node to Main-1 at the adjacent node


N
(Starting Node)
MAIN-1
MAIN-2
MAIN-2
N+3
MAIN-1
MAIN-1
N+1
MAIN-2
MAIN-2
MAIN-1
N+2
nc-dmx-255

Procedure 12-8.1: Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-8.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-202)

2 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the pre Series 1:6 LNW27, 29, 76, or 221–259 OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Result: The Series 1:6 or later version OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `inc. OC48 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-8.2: Replace LNW26B, 28, 77, 121B-159B OC-48 OLIU in Main slot M1 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to replace the LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack in Main slot **M1** of the starting node with the temporary replacement OC-48 OLIU circuit pack.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-8.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-202)

2 **Important!** Acceptable temporary replacement OC-48 OLIU circuit packs include the LNWUPG, LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs. For more information, refer to “Required equipment” (p. 12-174).

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

5 

NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-8.3: Upgrade high-speed UPSR connections at node equipped with incompatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Incompatible OC-48 OLIU circuit packs include the LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service high-speed UPSR connections at a node equipped with an *incompatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-8.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-202)

2 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to “Ring Upgrade Mode” (p. 12-171).

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The system reports an `unexpected CP type` *alarm* for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

4 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-192 OLIU circuit pack in Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the upgraded OC-192 optical span, the `inc. OC192 LOS` alarm clears.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

5



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the upgraded optical span between Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span.

6 

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

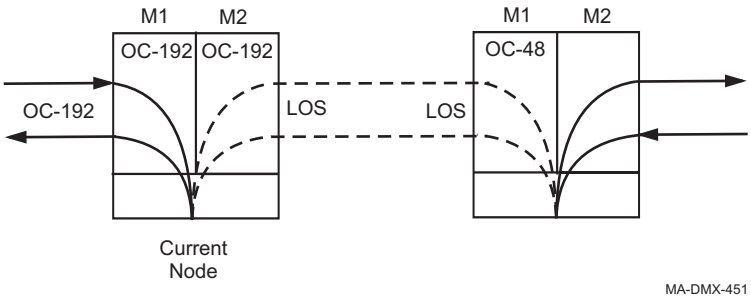
Open a faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-192 OLIU circuit pack.

Result: The replacement OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-8.4: Upgrade high-speed UPSR connections at node equipped with compatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Compatible OC-48 OLIU circuit packs include LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service high-speed UPSR connections at a node equipped with a *compatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 Are you upgrading a Very Large Fabric (VLF) multi-port, multi-rate LNW82 OLIU to Very Large Fabric (VLF) LNW59 OC-192 OLIU (one port)?

If...	Then...
Yes	Upgrading an LNW82 circuit pack to an LNW59 circuit pack is only allowed Port 1 of the LNW82 circuit packs is provisioned as OC-48 and and all other OC-n ports are provisioned as STNA. Continue with Step 2.
No	Proceed to Step 4.

2 Determine the port provisioning of the LNW82, port 1 at the starting node using **Reports** → **Equipment Lists** → **Ports**.Click *CP main-1* and then click **Select**. Observe the *Port Type* and *Application* of Main-1-1 and the other ports. Click **Close**.

3 What is the *Port Type* and *Application* of Main-1-1?

If...	Then...
OC48, upsr and all other ports are STNA	Continue with Step 4.
OC48 upsr and one or more of the remaining ports has a *Port Type* of OC3, OC12, or OC48	You must roll all traffic from the other ports to any OC-3/12/48 ports in the Function slots in the same shelf. Proceed to Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50) to roll the traffic. For each port that you rolled traffic from, change *Signal Type* to STNA. 1. Select **Configuration** → **Equipment** from the System View main menu. 2. Expand the LNW82 circuit pack details and highlight the OCN port and click **Select**. 3. For *Signal Type*, select STNA from the drop down menu and click **Apply**. Refer to "Signal Type: STNA " (p. 12-200) if you have issues changing the Signal Type. 4. Repeat this procedure, Procedure 12-8.4: "Upgrade high-speed UPSR connections at node equipped with compatible OC-48 OLIU in Main slot M2" (p. 12-195).
OC48, blsr and all other ports are STNA	Proceed to Procedure 12-11: "Upgrade OC-48 BLSR to OC-192 BLSR" (p. 12-236).

If...	Then...
OC48, blsr and one or more of the remaining ports has a *Port Type* of OC3, OC12, or OC48	You must roll all traffic from the other ports to any OC-3/12/48 ports in the Function slots in the same shelf. Proceed to Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50) to roll the traffic. For each port that you rolled traffic from, change *Signal Type* to STNA. 1. Select **Configuration** → **Equipment** from the System View main menu. 2. Expand the LNW82 circuit pack details and highlight the OCN port and click **Select**. 3. For *Signal Type*, select STNA from the drop down menu and click **Apply**. Refer to "Signal Type: STNA " (p. 12-200) if you have issues changing the Signal Type. 4. Proceed to Procedure 12-11: "Upgrade OC-48 BLSR to OC-192 BLSR" (p. 12-236).
OC3 or OC12 (*Application* does not matter)	Upgrade of Port 1 to an LNW59 is not supported. End of procedure.

4 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-8.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-202)

5 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-171).

6 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit may occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` *condition* and an `inc. OC48 LOS` alarm for Main slot **M1**.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

7 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-192 OLIU circuit pack in Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M2**.

9 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-8.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-202)

10



NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-192 OLIU circuit pack.

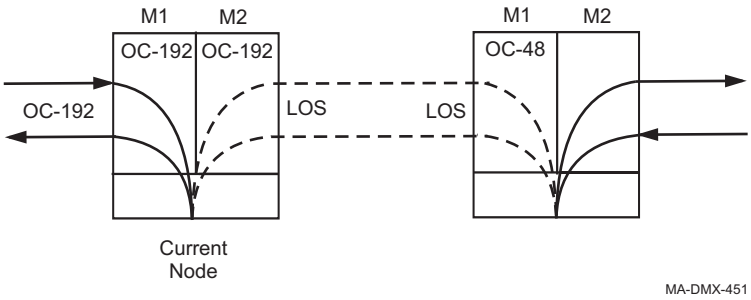
Result: A transmission hit will occur after the OC-48 OLIU circuit pack is removed. The transmission hit is the result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Signal Type: STNA

Select STNA to change the rate of an optical line on a multirate pack to unprovisioned.

STNA is the initial value for all ports when the circuit pack is accepted into a function/growth group with no expected circuit pack type. If the companion circuit pack is an accepted circuit pack with the same circuit pack type, the value is set to the Signal Type of the companion for protected appications. For 0x1 applications, the value is set to STNA

When provisioned STNA, synchronization messaging (syncmsg) is DISABLED, DCC is DISABLED (and is not retrievable), and there is no line primary state (pst). No DBCHG messages are issued for those parameters which changed. No line parameters other than may be provisioned or retrieved. When the Signal Type parameter is changed from STNA to any other value, the port application is set to 0x1. All other port parameters are set to their default values.

STNA value is not allowed if

- the port is the synchronization source, or is the companion of the source when sync autoreconfiguration is enabled
- Port Class (Control Plane Tab) is provisioned as ENNI or Edge
- cross-connections, Signal Type test access sessions, or loopbacks are present on the port

Note: If Signal Type is OC-48 on ports 1, 3, 5, or 7, then the STNA ports 2, 4, 6, or 8 are NOT provisionable as OC-48 uses up bandwidth for both the odd and the next higher even port as well. For example, if port 3 is configured for OC-48, port 4 is STNA and is not configurable.

Procedure 12-8.5: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack to be replaced (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack to be replaced). Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, optional manual switches can be performed before replacing the circuit pack. In UPSRs, each path supported by the circuit pack to be replaced must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack to be replaced. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-8.6: Verify spanning tree configuration

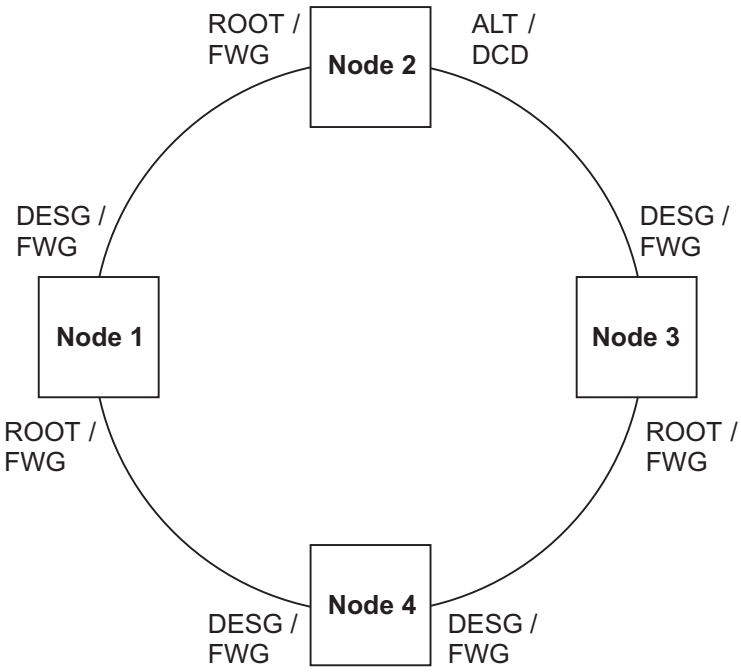
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-204).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

If required, change the existing spanning tree configuration.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-9: Back out OC-48 UPSR to OC-192 UPSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out an OC-48 UPSR to OC-192 upgrade.

Backing out of an upgrade in progress returns *all* nodes in the ring to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-10: “Suspend OC-48 UPSR to OC-192 UPSR upgrade” (p. 12-227).

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OC-48 OLIU circuit packs for each node to be backed out
- The temporary replacement OC-48 OLIU circuit pack is required if Main slot **M1** of the starting node was originally equipped with an LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack.
- As the upgrade is backed out around the UPSR, ensure that technicians are available at each end of an optical span as the upgrade is backed out.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.
3. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-48 to OC-192 UPSR upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the starting node, and the ring upgrade is complete (all nodes are in the Ring Upgrade Mode),	Log in to the starting node (refer to the "UPSR example" (p. 12-217) at the end of the procedure) and continue with Step 3.
not the starting node,	Log in to the last node upgraded (refer to the "UPSR example" (p. 12-217) at the end of the procedure) and proceed to Step 7.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-9.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-225)

4 Using office records, determine the original OC-48 OLIU circuit pack types installed in the Main slots.

5



NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

Important! If Main slot **M1** of the starting node was originally equipped with an LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack, the temporary replacement OC-48 OLIU circuit pack must be installed in Main slot **M1** while backing out of the upgrade. As a final step, the temporary replacement OC-48 OLIU circuit pack is replaced with the original OC-48 OLIU circuit pack.

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M1**. Then replace the OC-192 OLIU circuit pack in Main slot **M1** with the required original or temporary replacement OC-48 OLIU circuit pack.

Result: A transmission hit will occur after the OC-48 OLIU circuit pack is inserted in the slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

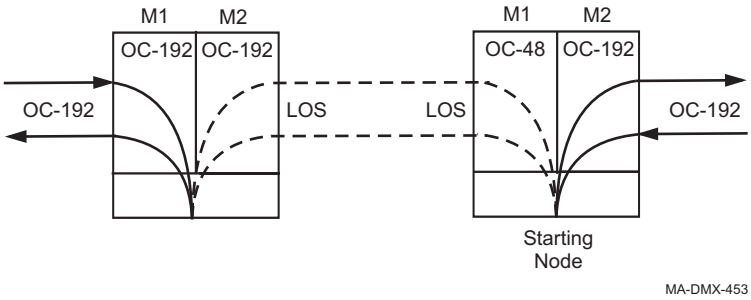
The system reports an `unexpected circuit pack type` *condition* and an `inc. OC192 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

This completes the first phase of the back out at the starting node. The back out at the starting node will be completed after backing out of all the other nodes in the ring.

The following figure shows the state of the starting node and the adjacent optical spans.



6 Log in to the adjacent node connected to Main slot **M1**. (Refer to the "UPSR example" (p. 12-217) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 Using office records, determine the original OC-48 OLIU circuit pack types installed in the Main slots.

8

If Main slot M2 was originally equipped with an...	Then back out the high-speed UPSR upgrade using...
LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack,	Procedure 12-9.1: "Back out high-speed UPSR upgrade at node originally equipped with incompatible OC-48 OLIU in Main slot M2" (p. 12-218). Then continue with Step 9.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack,	Procedure 12-9.2: "Back out high-speed UPSR upgrade at node originally equipped with compatible OC-48 OLIU in Main slot M2" (p. 12-221). Then continue with Step 9.

For more information about compatible and incompatible OC-48 OLIU circuit packs. refer to Procedure 12-8: "Upgrade OC-48 UPSR to OC-192 UPSR" (p. 12-171).

9 Except for the starting node, has the upgrade been backed out of all nodes in the UPSR?

If...	Then...
No	Repeat Step 6 through Step 8 as required at the next node. (Refer to the "UPSR example" (p. 12-217) at the end of the procedure.)
Yes	Continue with Step 10.

10 Log in to the starting node. (Refer to the "UPSR example" (p. 12-217) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

11 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M2**.

12 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-9.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-225)

13 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**. Then replace the OC-192 OLIU circuit pack in Main slot **M2** with the original OC-48 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is removed. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

If...	Then...
an incompatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**.
a compatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned. The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

For more information about compatible and incompatible OC-48 OLIU circuit packs. refer to Procedure 12-8: “Upgrade OC-48 UPSR to OC-192 UPSR” (p. 12-171).

14 At both ends of the optical span to be backed out, perform the following to connect the original OC-48 circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result:

If...	Then...
an incompatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The system still reports an `unexpected CP type` *alarm* for Main slot **M2**. Continue with Step 15.

If...	Then...
a compatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-48 optical span. Proceed to Step 19.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

15 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**.

16 **Important!** This step is required only if Main slot **M1** is equipped with the temporary replacement OC-48 OLIU circuit pack.

If required, open a faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Then replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the original OC-48 OLIU circuit pack.

Result: The original OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

17 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

18 Clean all fiber connectors, and connect the transmit and receive optical fibers to the original OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-48 optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

19 **Important!** At each node in the UPSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the UPSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

20 **Important!** This completes the backout procedure, except for taking the nodes out of the Ring Upgrade Mode. The decision to take the nodes out of the Ring Upgrade Mode or leave them depends on the reason the back out was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, UPSR cross-connections cannot be created or removed.

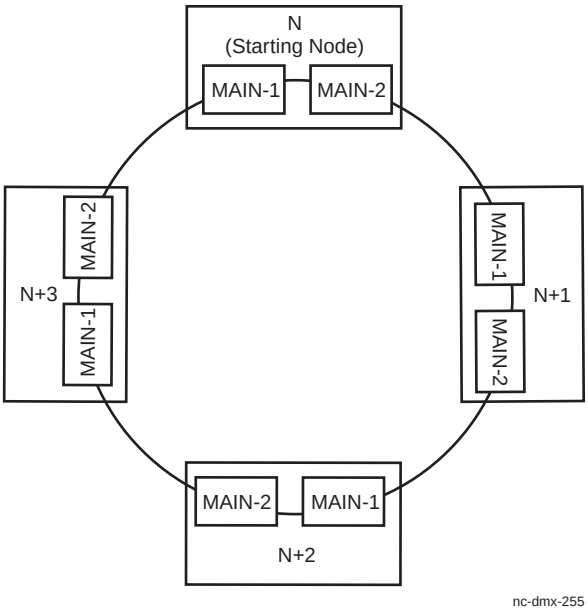
If required at each node in the UPSR, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

UPSR example



Procedure 12-9.1: Back out high-speed UPSR upgrade at node originally equipped with incompatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Incompatible OC-48 OLIU circuit packs include the LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-48 UPSR to OC-192 UPSR upgrade at a node originally equipped with an *incompatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with OC-192 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been upgraded with an OC-192 OLIU circuit pack,	Proceed to Step 5.

2 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-9.3: “Verify active/standby status of circuit pack to be replaced” (p. 12-225)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**. Then replace the OC-192 OLIU circuit pack in Main slot **M2** with the original OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be backed out, perform the following to connect the original OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the original optical span between Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span.

6 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

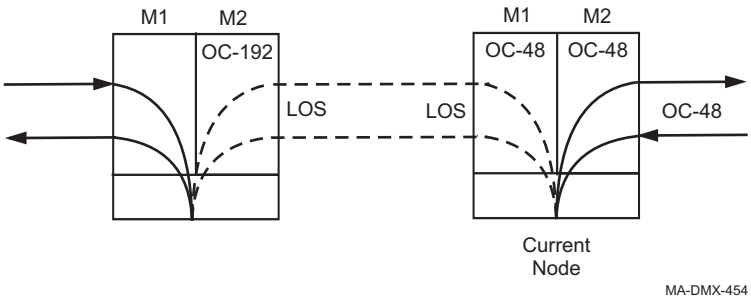
Open a faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M1**. Then replace the OC-192 OLIU circuit pack in Main slot **M1** with the original OC-48 OLIU circuit pack.

Result: The original OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-9.2: Back out high-speed UPSR upgrade at node originally equipped with compatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Compatible OC-48 OLIU circuit packs include LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-48 UPSR to OC-192 UPSR upgrade at a node originally equipped with a *compatible* OC-48 OLIU circuit packs in Main slot **M2**.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with OC-192 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been upgraded with an OC-192 OLIU circuit pack,	Proceed to Step 5.

2 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-9.3: “Verify active/standby status of circuit pack to be replaced” (p. 12-225)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**. Then replace the OC-192 OLIU circuit pack in Main slot **M2** with the original OC-48 OLIU circuit pack.

Result: A transmission hit will occur after the OC-48 OLIU is inserted. The transmission hit is the result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` *condition* and an `inc. OC192 LOS` alarm for Main slot **M2**.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be backed out, perform the following to connect the original OC-48 circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC192 LOS` alarm clears. Transmission is now supported on the original OC-48 optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

6 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-9.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-225)

7



NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M1**. Then replace the OC-192 OLIU circuit pack in Main slot **M1** with the original OC-48 OLIU circuit pack.

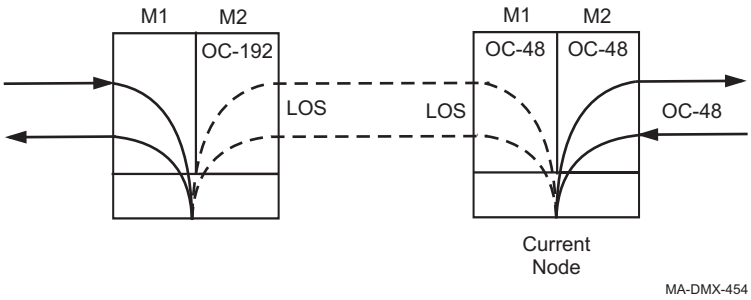
Result: A transmission hit will occur after the OC-192 OLIU is removed. The transmission hit is the result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The original OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-9.3: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack to be replaced (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack to be replaced). Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, optional manual switches can be performed before replacing the circuit pack. In UPSRs, each path supported by the circuit pack to be replaced must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack to be replaced. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-10: Suspend OC-48 UPSR to OC-192 UPSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to temporarily suspend a OC-48 UPSR to OC-192 UPSR upgrade.

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the ring to their pre-upgrade state, refer to Procedure 12-9: “Back out OC-48 UPSR to OC-192 UPSR upgrade” (p. 12-208).

When the ring upgrade is temporarily suspended before completion, some spans are operating at the OC-48 line rate and some at the OC-192 line rate. This requires two nodes that are equipped with an OC-48 OLIU circuit pack in one Main slot and an OC-192 OLIU circuit pack in the other Main slot. These nodes are the starting node and the last node upgraded.

To continue to operate temporarily with different circuit packs in the Main slots, the starting node and the nodes that have been upgraded must remain in the Ring Upgrade Mode.

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- One original OC-48 OLIU circuit pack if the upgrade is suspended at an upgraded node originally equipped with LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs
- One LNW27 (Series 1:6 and later) or LNWUPG OC-48 OLIU circuit pack (temporarily required if the upgrade is suspended at a partially upgraded node originally equipped with LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs)

  The LNWUPG OC-48 OLIU circuit pack is a special LNW27 OC-48 OLIU circuit pack that is intended for use only as the temporary transition circuit pack. There are no differences between the LNW27 (Series 1:6 and later) and LNWUPG circuit packs with respect to in-service backouts/suspends.

  The LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs may also be used as the temporary replacement circuit packs. However, the temporary replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long range optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this suspend procedure.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to temporarily suspend an OC-48 UPSR to OC-192 UPSR upgrade.

1 Identify the last node that was upgraded.

If...	Then log in to the...
both Main slots have been upgraded,	last node upgraded (refer to the "UPSR example" (p. 12-235) at the end of the procedure) and continue with Step 2.
one Main slot has been upgraded and the node was originally equipped with LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs	last node upgraded (refer to the "UPSR example" (p. 12-235) at the end of the procedure) and proceed to Step 8.
one Main slot has been upgraded and the node was originally equipped with LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs	last node upgraded (refer to the "UPSR example" (p. 12-235) at the end of the procedure) and proceed to Step 11.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 **Important!** Both Main slots have been upgraded, and the **Configuration** → **Update System** → **Upgrade** command has been performed. All traffic is now active on Main slot **M1**, and the system is reporting an `inc. OC192 LOS` alarm for Main slot **M2**.

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the OC-192 OLIU circuit pack in Main slot **M2**.

If the local operating procedures specify...	Then...
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 6.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 3.

3 **Important!** This step is optional. If the OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the OC-192 OLIU circuit pack in Main slot **M2**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

4 **Important!** This step is optional. If the OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-192 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

5 If required, repeat Step 3 to verify that the circuit pack in Main slot **M1** is now the active circuit pack for timing.

6 Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**.

If the Main slots were originally equipped with...	Then replace the OC-192 OLIU circuit pack in Main slot M2 with...
LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, or LNW221–259 (pre Series 1:6) OC-48 OLIUs,	the temporary replacement OC-48 OLIU circuit pack.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIUs,	the original OC-48 OLIU circuit pack

Result: The OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `inc. OC192 LOS` alarm for Main slot **M2** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

7 At both ends of the optical span, perform the following to connect the OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC192 LOS` alarm for Main slot **M2** clears, and the system still reports an `unexpected circuit pack type` condition for Main slot **M2**.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

   STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

   To resume the upgrade, replace the OC-48 OLIU circuit pack in Main slot **M2** with the OC-192 OLIU circuit pack. Refer to Procedure 12-8: “Upgrade OC-48 UPSR to OC-192 UPSR” (p. 12-171).

   To back out the upgrade, refer to Procedure 12-9: “Back out OC-48 UPSR to OC-192 UPSR upgrade” (p. 12-208).

8 **Important!** Main slot **M1** has been upgraded and the node was originally equipped with LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs.

If an `unexpected CP type` alarm is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, proceed to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**.

9 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement OC-48 OLIU circuit pack.

Result: The temporary replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M2** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 At both ends of the optical span, perform the following to connect the temporary replacement OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarm for Main slot **M2** clears, and the system still reports an `unexpected circuit pack type` condition for Main slot **M2**.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the OC-48 OLIU circuit pack in Main slot **M2** with the OC-192 OLIU circuit pack. Refer to Procedure 12-8: “Upgrade OC-48 UPSR to OC-192 UPSR” (p. 12-171).

To back out the upgrade, refer to Procedure 12-9: “Back out OC-48 UPSR to OC-192 UPSR upgrade” (p. 12-208).

11 **Important!** Main slot **M1** has been upgraded and the node was originally equipped with LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs.

If an `unexpected circuit pack type` condition is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, the node is already in the proper suspend configuration and no further action is required.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M2**.

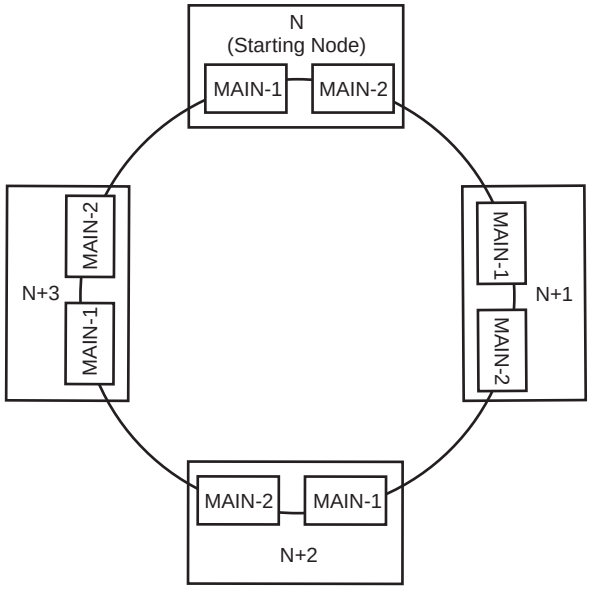
STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the OC-48 OLIU circuit pack in Main slot **M2** with the OC-192 OLIU circuit pack. Refer to Procedure 12-8: “Upgrade OC-48 UPSR to OC-192 UPSR” (p. 12-171).

To back out the upgrade, refer to Procedure 12-9: “Back out OC-48 UPSR to OC-192 UPSR upgrade” (p. 12-208).

END OF STEPS

UPSR example



Procedure 12-11: Upgrade OC-48 BLSR to OC-192 BLSR

Overview

Important! The BLSR must be equipped with Alcatel-Lucent 1665 DMX nodes only. This upgrade procedure does *not* support upgrading BLSRs equipped with nodes other than Alcatel-Lucent 1665 DMX.

Use this procedure to upgrade an in-service OC-48 BLSR to a OC-192 BLSR. The supported upgrades include non-VLF to non-VLF upgrades and VLF to VLF upgrades.

Important! Systems equipped with VLF mains (LNW82, LNW59, LNW504) support extra traffic on all OC-192 BLSRs (Main and Function). Systems equipped with non-VLF OC-48 mains support extra traffic on the main OC-48 BLSRs only. Regardless of equipage combinations, extra traffic is not supported on any other BLSR.

Note: To upgrade an in-service non-VLF OC-48 BLSR to a VLF OC-192 BLSR, refer to Procedure 12-22: "Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR" (p. 12-447).

The OC-48 OLIU circuit packs in the Main slots are upgraded at each node. Low-speed OC-48 BLSR upgrades are not supported in this release.

This procedure assumes that in the BLSR, the circuit pack in Main slot **M1** is always connected to the circuit pack in Main slot **M2** of the adjacent node. (Refer to the "BLSR example" (p. 12-251) at the end of the procedure.)

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Ring Upgrade Mode

During the upgrade, each node in the ring must be provisioned in the Ring Upgrade Mode. The Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack and prohibits the following operations:

- Software upgrades to the node (**APPLY**, **INS-PRGM**)
- Cross-connection provisioning (**ENT-CRS**, **DLT-CRS**)
- Manual equipment protection switching of the Function/Growth slots (**SW-TOPROTN**, **SW-TOWKG**)

While the node is in the Ring Upgrade Mode, the BLSR protection group Wait to Restore timer is automatically provisioned *0*. The Wait to Restore timer returns to the original provisioned value when the node leaves the Ring Upgrade Mode.

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded ring, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Compatible and incompatible OC-48 OLIU circuit packs

The original OC-48 OLIU and replacement OC-192 OLIU circuit packs have compatible or incompatible VT cross-connection fabrics.

Compatible OC-48 OLIU circuit packs

Compatible OC-48 OLIU circuit packs and the replacement OC-192 OLIU circuit packs have the *compatible* VT cross-connection fabrics. During the upgrade when one Main slot is equipped with a compatible OC-48 OLIU circuit pack and the companion Main slot is equipped with a replacement OC-192 OLIU circuit pack, all add/drop and through traffic is supported. The system reports an `unexpected circuit pack type` *condition*, and the affected circuit pack is not failed.

The following OC-48 OLIU circuit packs are compatible with the replacement OC-192 OLIU circuit packs:

- LNW27 (Series 1:6 and later)
- LNW29 (Series 1:6 and later)
- LNW32
- LNW76 (Series 1:6 and later)
- LNW202
- LNW221–259 (Series 1:6 and later)

These OC-48 OLIU circuit packs have different optics and transmit wavelengths. However, these circuit packs are functionally and electrically the same. There are no differences between these circuit packs for the purposes of ring upgrades.

Refer to "Required equipment" (p. 12-239) for a complete list of supported replacement OC-192 OLIU circuit packs.

Incompatible OC-48 OLIU circuit packs

Incompatible OC-48 OLIU circuit packs and the replacement OC-192 OLIU circuit packs have *different* VT cross-connection fabrics. During the upgrade when one Main slot is equipped with an incompatible OC-48 OLIU circuit pack and the companion Main slot is equipped with a replacement OC-192 OLIU circuit pack, VT pass-through transmission is not supported. The system reports an `unexpected CP type` *alarm*, and the affected circuit pack is failed.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

The following OC-48 OLIU circuit packs are incompatible with the replacement OC-192 OLIU circuit packs:

- LNW26B
- LNW27 (pre Series 1:6)
- LNW28
- LNW29 (pre Series 1:6)
- LNW76 (pre Series 1:6)
- LNW77
- LNW121B–159B
- LNW221–259 (pre Series 1:6)

These OC-48 OLIU circuit packs have different optics and transmit wavelengths. However, these circuit packs are functionally and electrically the same. There are no differences between these circuit packs for the purposes of ring upgrades.

Refer to "Required equipment" (p. 12-239) for a complete list of supported replacement OC-192 OLIU circuit packs.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, "System configuration procedures".

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.

If the Remote NE Status parameter is...	Then...
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- The following lightguide buildouts (LBOs) should be available:
  - 5-dB loss LBO (code ABLCS-05.0: comcode 108279381)
  - 10-dB loss LBO (code ABLCS-10.0: comcode 108279431)
  - 15-dB loss LBO (code ABLCS-15.0: comcode 108279480)
- Lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269)
- As optical spans are upgraded around the BLSR, ensure that technicians are available at each end of an optical span as it is upgraded.
- If Main slot **M1** at the first node to be upgraded is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack, *one* Series 1:6 or later version of the same OC-48 OLIU circuit pack type is temporarily required. For example if the first node to be upgraded is equipped with pre Series 1:6 LNW27 OC-48 OLIU circuit packs, then 1 Series 1:6 or later LNW27 OC-48 OLIU circuit pack is temporarily required.
- If Main slot **M1** at the first node to be upgraded is equipped with an LNW26B, LNW28, LNW77, and/or LNW121B–159B OC-48 OLIU circuit pack, *one* LNW27 (Series 1:6 and later) or LNWUPG OC-48 OLIU circuit pack is temporarily required.

The LNWUPG OC-48 OLIU circuit pack is a special LNW27 OC-48 OLIU circuit pack that is intended for use only as the temporary transition circuit pack during ring upgrades. There are no differences between the LNW27 (Series 1:6 and later) and LNWUPG circuit packs with respect to in-service upgrades.

An LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack may also be used as the temporary replacement circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.

- 2 replacement LNW56, LNW57, LNW58, LNW60, LNW502, LNW523, LNW527, LNW554, or LNW555 OC-192 OLIU circuit packs (Series 1:1 and later) for each node.

  To upgrade an in-service BLSR using the Very Large Fabric (VLF) LNW59 OC-192 OLIU circuit packs, refer to Procedure 12-22: “Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR” (p. 12-447).

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.

  Important! Release 3.0 or later software is required to support the OC-192 OLIU circuit packs.

  Release 3.0 or later software is required to support LNW555 OC-192 OLIU circuit packs.

  Release 4.0 or later software is required to support LNW57, LNW523, LNW527, and LNW554 OC-192 OLIU circuit packs.

  Release 5.1 or later software is required to support LNW60 OC-192 OLIU circuit packs.

  Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the BLSR and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-192 OLIU circuit packs. Ensure that the OC-192 OLIU circuit packs are compatible with each fiber span in the BLSR. Attenuation and Dispersion may be limiting factors at longer span lengths.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.
5. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to upgrade an in-service OC-48 BLSR to an OC-192 BLSR.

1 From office records and work instructions, determine the current network configuration.

2 Log in to a node in the BLSR to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Select **View** → **Rings** → **Ring Map**. Click on required Ring ID and **Select**. Click **View Graphic** and observe the ring map diagram. Note how the nodes are connected in the ring and make a drawing of the ring map diagram to reference during this upgrade procedure.

4 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

5 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

6 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

7 **Important!** During this upgrade, any OC-48 BLSR extra traffic tributaries (unprotected) are mapped to the same tributaries (protected) on the OC-192 BLSR. Therefore, traffic that is unprotected on the OC-48 BLSR will be protected on the upgraded OC-192 BLSR.

Select **View** → **Cross-Connections** to access the required circuit packs and obtain a current list of cross-connections.

If required, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and delete/change the existing OC-48 BLSR extra traffic cross-connections.

8 **Important!** Before upgrading the BLSR, Automatic Ring Discovery must be disabled.

Select **View** → **Protection** to access the *2F BLSR main-1-1* protection group and click **Select**. Click on the Provisionable Parameters tab and observe the *Automatic Ring Discovery* parameter.

If required, select **Configuration** → **Equipment** to access the *2F BLSR main-1-1* protection group and Disable Automatic Ring Discovery.

Important! If necessary, record the original parameter value to be reprovisioned after the upgrade is completed.

9 At each of the remaining nodes in the BLSR, log in to the node and repeat Step 3 through Step 8. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

10 **NOTICE**

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-11.6: "Verify spanning tree configuration" (p. 12-269)

11 Identify and log in to the starting node. (Refer to the "BLSR example" (p. 12-251) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

12 Determine the OC-48 OLIU circuit pack types installed in the Main slots of the starting node using **Reports** → **Equipment Lists** → **Packs**. Click *Shelf* and **Select**. Observe the *Apparatus Code* and *Series Number* of the *main-1* and *main-2* circuit packs. Click **Close**.

13 **Important!** If Main slot **M1** of the starting node is equipped with a pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type. The Series 1:6 or later OC-48 OLIU circuit pack maintains traffic with the last node to be upgraded while Main slot **M2** and the other nodes in the ring are upgraded. As a final step, the Series 1:6 or later OC-48 OLIU circuit pack is upgraded.

If required, replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Reference: Procedure 12-11.1: "Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node" (p. 12-252)

14 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View at the starting node, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-236).

15 **Important!** If Main slot **M1** of the starting node is equipped with an LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a temporary replacement OC-48 OLIU circuit pack. (Refer to "Required equipment" (p. 12-239) for a list of acceptable temporary replacement OC-48 OLIU circuit packs.) The temporary replacement OC-48 OLIU circuit pack maintains traffic with the last node to be upgraded while Main slot **M2** and the other nodes in the ring are upgraded. As a final step, this temporary replacement OC-48 OLIU circuit pack is upgraded.

If required, replace the LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a temporary replacement OC-48 OLIU circuit pack.

Reference: Procedure 12-11.2: "Replace LNW26B, 28, 77, 121B-159B OC-48 OLIU in Main slot M1 of starting node" (p. 12-254)

16 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-267)

17 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

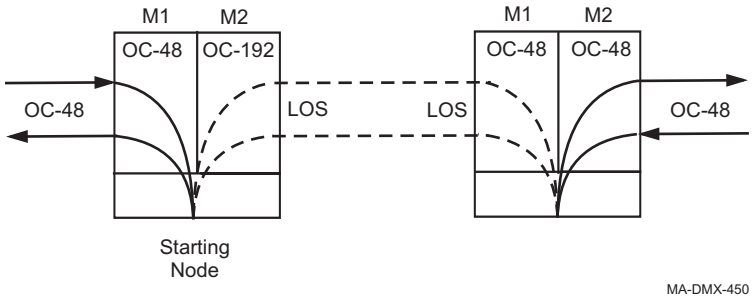
The system reports an `unexpected circuit pack type` *condition* and an `OC48 LOS` alarm for Main slot **M2**. The system also reports a `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

This completes the first phase of the BLSR upgrade at the starting node. The starting node upgrade will be completed after all the other nodes in the ring are upgraded.

The following figure shows the state of the starting node and the adjacent optical spans.



18 Log in to the adjacent node connected to Main slot **M2**. (Refer to the "BLSR example" (p. 12-251) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

19 Determine the OC-48 OLIU circuit pack types installed in the Main slots using **Reports** → **Equipment Lists** → **Packs**. Click *Shelf* and **Select**. Observe the *Apparatus Code* and *Series Number* of the *main-1* and *main-2* circuit packs. Click **Close**.

20

If Main slot M2 is equipped with an...	Then upgrade the high-speed BLSR connections using...
LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack,	Procedure 12-11.3: "Upgrade high-speed BLSR connections at node equipped with incompatible OC-48 OLIU in Main slot M2" (p. 12-257). Then continue with Step 21.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack,	Procedure 12-11.4: "Upgrade high-speed BLSR connections at node equipped with compatible OC-48 OLIU in Main slot M2" (p. 12-261). Then continue with Step 21.

Refer to "Compatible and incompatible OC-48 OLIU circuit packs" (p. 12-237) for more information about compatible and incompatible OC-48 OLIU circuit packs.

21 Except for the starting node, have all nodes in the BLSR been upgraded?

If...	Then...
No	Repeat Step 18 through Step 20 as required at the next node. (Refer to the "BLSR example" (p. 12-251) at the end of the procedure.)
Yes	Continue with Step 22.

22 Log in to the starting node. (Refer to the "BLSR example" (p. 12-251) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

23 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

24 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-267)

25 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears. The system reports an `inc. OC192 LOS` alarm and `Line Automatic Switch` condition for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

26 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-192 OLIU circuit pack in Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarms and `Line Automatic Switch` conditions clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

27 **Important!** At each node in the BLSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the BLSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

28 **Important!** The network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node cannot be returned to the pre-upgrade state using the backout procedure.

At each node in the BLSR, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

29 At each node in the BLSR, select **View** → **Protection** to access the *2F BLSR main-1-1* protection group and click **Select**. Click on the Provisionable Parameters tab and observe the *Automatic Ring Discovery* parameter.

If required, select **Configuration** → **Equipment** to access the *2F BLSR main-1-1* protection group and Enable Automatic Ring Discovery.

30 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the BLSR, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

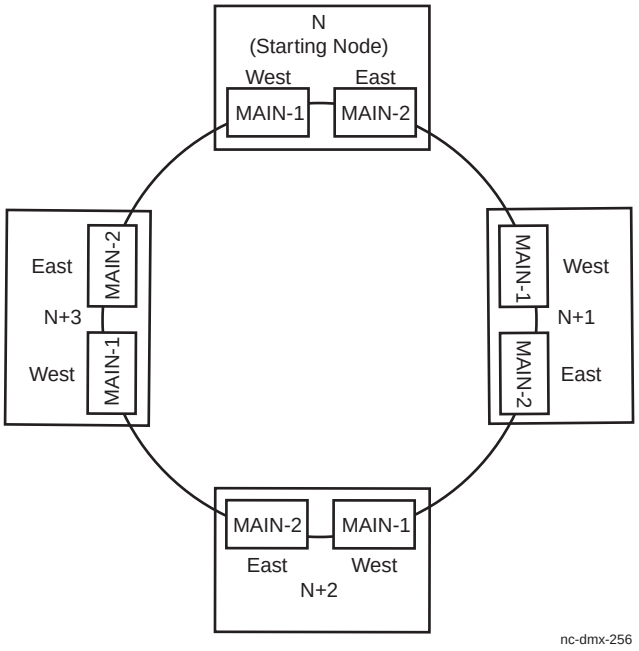
END OF STEPS

BLSR example

Starting Node: Alcatel-Lucent 1665 DMX Node N

Starting Circuit Pack: Main-2 at the Starting Node

Direction of Upgrade: Clockwise around BLSR from Main-2 at the Starting Node to Main-1 at the adjacent node.



Procedure 12-11.1: Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-267)

2 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the pre Series 1:6 LNW27, 29, 76, or 221–259 OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Result: The Series 1:6 or later version OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `inc. OC48 LOS` alarm and `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms and `Line Automatic Switch` conditions clear. Transmission is now supported on the optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-11.2: Replace LNW26B, 28, 77, 121B-159B OC-48 OLIU in Main slot M1 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to replace the LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack in Main slot **M1** of the starting node with the temporary replacement OC-48 OLIU circuit pack.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-267)

2 **Important!** Acceptable temporary replacement OC-48 OLIU circuit packs include the LNWUPG, LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs. For more information, refer to “Required equipment” (p. 12-239).

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

5 

NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1** clear, and the system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-11.3: Upgrade high-speed BLSR connections at node equipped with incompatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Incompatible OC-48 OLIU circuit packs include the LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to upgrade the in-service high-speed BLSR connections at a node equipped with an *incompatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: “Verify active/standby status of circuit pack to be replaced” (p. 12-267)

2 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to “Ring Upgrade Mode” (p. 12-236).

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

4 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-192 OLIU circuit pack in Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the upgraded OC-192 optical span, the `inc. OC192 LOS` alarm clears and the system reports a `Default K-bytes` alarm.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

5



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the upgraded OC-192 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the upgraded optical span between Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span.

6 

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

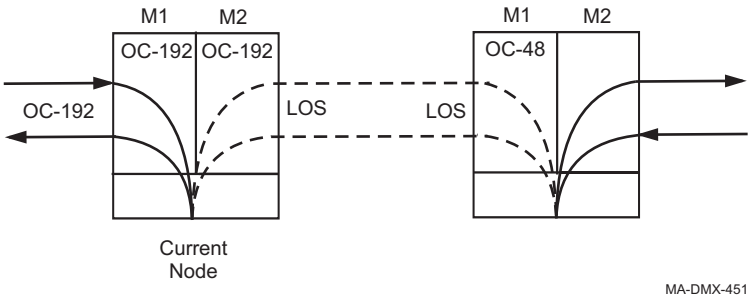
Open a faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-192 OLIU circuit pack.

Result: The replacement OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-11.4: Upgrade high-speed BLSR connections at node equipped with compatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Compatible OC-48 OLIU circuit packs include LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to upgrade the in-service high-speed BLSR connections at a node equipped with a *compatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 Are you upgrading a Very Large Fabric (VLF) multi-port, multi-rate LNW82 OLIU to a Very Large Fabric (VLF) LNW59 OC-192 OLIU (one port)?

If...	Then...
Yes	Upgrading an LNW82 circuit pack to an LNW59 circuit pack is only allowed if Port 1 of the LNW82 circuit packs is provisioned as OC-48 and and all other OC-n ports are provisioned as STNA. Continue with Step 2.
No	Proceed to Step 4.

2 Determine the port provisioning of the LNW82, port 1 at the starting node using **Reports** → **Equipment Lists** → **Ports**.Click *CP main-1* and then click **Select**. Observe the *Port Type* and *Application* of Main-1-1 and the other ports. Click **Close**.

3 What is the *Port Type* and *Application* of Main-1-1?

If...	Then...
OC48, blsr and all other ports are STNA	Continue with Step 4.
OC48 blsr and one or more of the remaining ports has a *Port Type* of OC3, OC12, or OC48	You must roll all traffic from the other ports to any OC-3/12/48 ports in the Function slots in the same shelf. Proceed to Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50) to roll the traffic. For each port that you rolled traffic from, change *Signal Type* to STNA. 1. Select **Configuration** → **Equipment** from the System View main menu. 2. Expand the LNW82 circuit pack details and highlight the OCN port and click **Select**. 3. For *Signal Type*, select STNA from the drop down menu and click **Apply**. Refer to "Signal Type: STNA " (p. 12-200) if you have issues changing the Signal Type. 4. Repeat this procedure, Procedure 12-11.4: "Upgrade high-speed BLSR connections at node equipped with compatible OC-48 OLIU in Main slot M2" (p. 12-261).
OC48, upsr and all other ports are STNA	Proceed to Procedure 12-8: "Upgrade OC-48 UPSR to OC-192 UPSR" (p. 12-171).

If...	Then...
OC48, upsr and one or more of the remaining ports has a *Port Type* of OC3, OC12, or OC48	You must roll all traffic from the other ports to any OC-3/12/48 ports in the Function slots in the same shelf. Proceed to Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50) to roll the traffic. For each port that you rolled traffic from, change *Signal Type* to STNA. 1. Select **Configuration** → **Equipment** from the System View main menu. 2. Expand the LNW82 circuit pack details and highlight the OCN port and click **Select**. 3. For *Signal Type*, select STNA from the drop down menu and click **Apply**. Refer to "Signal Type: STNA " (p. 12-200) if you have issues changing the Signal Type. 4. Proceed to Procedure 12-8: "Upgrade OC-48 UPSR to OC-192 UPSR" (p. 12-171).
OC3 or OC12 (*Application* does not matter)	Upgrade of Port 1 to an LNW59 is not supported. End of procedure.

4 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-267)

5 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-171).

6 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-192 OLIU circuit pack.

Result: A transmission hit may occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` *condition*, an `inc. OC48 LOS` alarm, and a `Line Automatic Switch` condition for Main slot **M1**.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

7 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-192 OLIU circuit pack in Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm and `Line Automatic Switch` condition clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M2**.

9 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-11.5: "Verify active/standby status of circuit pack to be replaced" (p. 12-267)

10 

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the replacement OC-192 OLIU circuit pack.

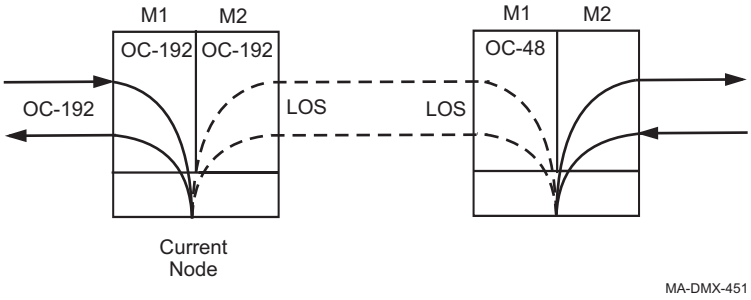
Result: A transmission hit will occur after the OC-48 OLIU circuit pack is removed. The transmission hit is the result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The replacement OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears. The system reports an `inc. OC192 LOS` alarm and a `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-11.5: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

From the System View select **Reports** → **Status Lists** → **Pack**. Click *Shelf* and **Select**. Observe the value of the *Switch State* parameter to determine if the circuit pack to be replaced is active for transmission. Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, an optional manual switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 6.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Click on *2F BLSR main-1-1* and **Select**. Select the required Direction for the circuit pack to be replaced (*West* for slot **M1** or *East* for slot **M2**) and *Manual to Protection, Ring* Switch Type, and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and **Close**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the Alarm List shows the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-11.6: Verify spanning tree configuration

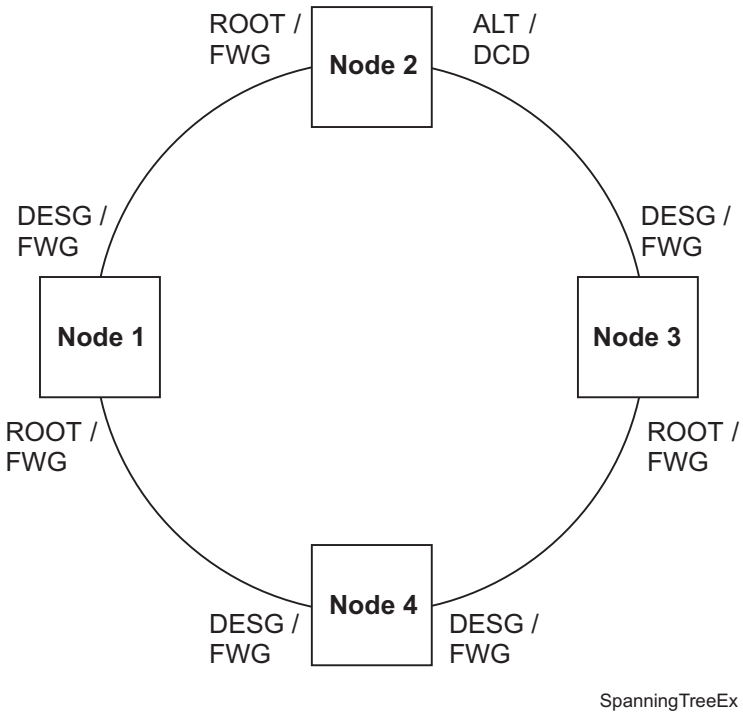
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-269).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

If required, change the existing spanning tree configuration.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-12: Back out OC-48 BLSR to OC-192 BLSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out of an OC-48 BLSR to OC-192 BLSR upgrade.

Backing out of an upgrade in progress returns *all* nodes in the ring to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-13: “Suspend OC-48 BLSR to OC-192 BLSR upgrade” (p. 12-294).

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Note: Auto Ring Discovery must be disabled for this procedure.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OC-48 OLIU circuit packs for each node to be backed out
- The temporary replacement OC-48 OLIU circuit pack is required if Main slot **M1** of the starting node was originally equipped with an LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack.
- As the upgrade is backed out around the BLSR, ensure that technicians are available at each end of an optical span as the upgrade is backed out.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.
3. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.
4. Disable Auto Ring Discovery.
   a. Select **View** → **Rings** → **Ring Map** from the System View main menu.
   b. Click the **Ring ID** tab, and highlight the Ring group.
      OR
      Click the **Ptn Grp** tab and highlight the 2F BLSR protection group. Click **Select**.
   c. Select Disable for *Automatic Ring Discovery*.

Steps

NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to back out an OC-48 to OC-192 BLSR upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node where action was taken.

If...	Then...
at the starting node and Main slot **M2** has been replaced and no other node has been upgraded. All nodes are in Ring Upgrade Mode.	Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2** and replace the OC-192 OLIU circuit pack in Main slot **M2** with the required original OC-48 OLIU circuit pack. Proceed to Step 14.
at the starting node and ring upgrade is complete. All nodes are in Ring Upgrade Mode.	Log in to starting node, refer to the Figure 12-1, "BLSR backout example" (p. 12-283), and proceed to Step 3.
not at the starting node and **M1** has been replaced, but no other action has been taken.	Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1** and replace the OC-192 OLIU circuit pack in Main slot **M1** with the required original OC-48 OLIU circuit pack. Proceed to Step 5.

If...	Then...
not at the starting node and the NODE upgrade is complete.	Log in to last node upgraded, refer to Figure 12-1, "BLSR backout example" (p. 12-283), and proceed to Step 8.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-12.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-292)

4 Using office records, determine the original OC-48 OLIU circuit pack types installed in the Main slots.

5 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

Important! If Main slot **M1** of the starting node was originally equipped with an LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack, the temporary replacement OC-48 OLIU circuit pack must be installed in Main slot **M1** while backing out of the upgrade. As a final step, the temporary replacement OC-48 OLIU circuit pack is replaced with the original OC-48 OLIU circuit pack.

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M1**. Then replace the OC-192 OLIU circuit pack in Main slot **M1** with the required original or temporary replacement OC-48 OLIU circuit pack.

Result: A transmission hit will occur after the temporary replacement OC-48 OLIU circuit pack is inserted in the slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

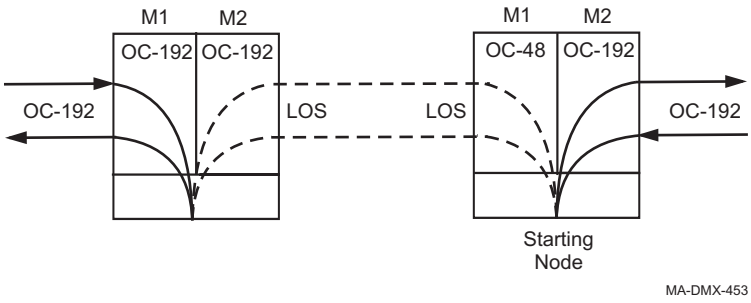
The system reports an `unexpected circuit pack type` *condition* and an `inc. OC192 LOS` alarm for Main slot **M1**. The system also reports a `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

This completes the first phase of the back out at the starting node. The back out at the starting node will be completed after backing out of all the other nodes in the ring.

The following figure shows the state of the starting node and the adjacent optical spans.



6 Log in to the adjacent node connected to Main slot **M1**. (Refer to the Figure 12-1, "BLSR backout example" (p. 12-283) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 Using office records, determine the original OC-48 OLIU circuit pack types installed in the Main slots.

8

If Main slot M2 was originally equipped with an...	Then back out the high-speed UPSR upgrade using...
LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack,	Procedure 12-12.1: "Back out high-speed BLSR upgrade at node originally equipped with incompatible OC-48 OLIU in Main slot M2" (p. 12-284). Then continue with Step 9.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack,	Procedure 12-12.2: "Back out high-speed BLSR upgrade at node originally equipped with compatible OC-48 OLIU in Main slot M2" (p. 12-288). Then continue with Step 9.

For more information about compatible and incompatible OC-48 OLIU circuit packs. refer to Procedure 12-11: "Upgrade OC-48 BLSR to OC-192 BLSR" (p. 12-236).

9 Except for the starting node, has the upgrade been backed out of all nodes in the BLSR?

If...	Then...
No,	Repeat Step 6 through Step 8 as required at the next node. Refer to the Figure 12-1, "BLSR backout example" (p. 12-283).
Yes,	Continue with Step 10.

10 Log in to the starting node. Refer to the Figure 12-1, "BLSR backout example" (p. 12-283).

Note: If **Configuration** → **System** → **Upgrade** not has been performed on the current node, proceed to Step 12.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

11 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears. The system reports an `unexpected circuit pack type` *condition* for Main slot **M2**.

12 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-12.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-292)

13 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**. Then replace the OC-192 OLIU circuit pack in Main slot **M2** with the original OC-48 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is removed. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

If...	Then...
an incompatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The `unexpected circuit pack type` *condition* for Main slot **M2** clears. The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M2**.
a compatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned. The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

For more information about compatible and incompatible OC-48 OLIU circuit packs. refer to Procedure 12-11: "Upgrade OC-48 BLSR to OC-192 BLSR" (p. 12-236).

14 At both ends of the optical span to be backed out, perform the following to connect the original OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result:

If...	Then...
an incompatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The system still reports an `unexpected CP type` *alarm* for Main slot **M2**. Continue with Step 15.
a compatible OC-48 OLIU circuit pack was installed in Main slot **M2**,	The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-48 optical span. Proceed to Step 19.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

15 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clear. The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M1**.

16 **Important!** This step is required only if Main slot **M1** is equipped with the temporary replacement OC-48 OLIU circuit pack.

If require, open a faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Then replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the original OC-48 OLIU circuit pack.

Result: The original OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

17 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

18 Clean all fiber connectors, and connect the transmit and receive optical fibers to the original OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-48 optical span.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

19 **Important!** At each node in the BLSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the BLSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

20 **Important!** This completes the backout procedure, except for taking the nodes out of the Ring Upgrade Mode and enabling Automatic Ring Discovery. The decision to take all nodes out of the Ring Upgrade Mode depends on the reason the back out was necessary, and what is required before again starting or completing the ring upgrade. All nodes must remain in the Ring Upgrade node until the ring upgrade is completed.

At each node in the BLSR as required, select **Configuration** → **Normal Mode** to take the node out of the Ring Upgrade Mode.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

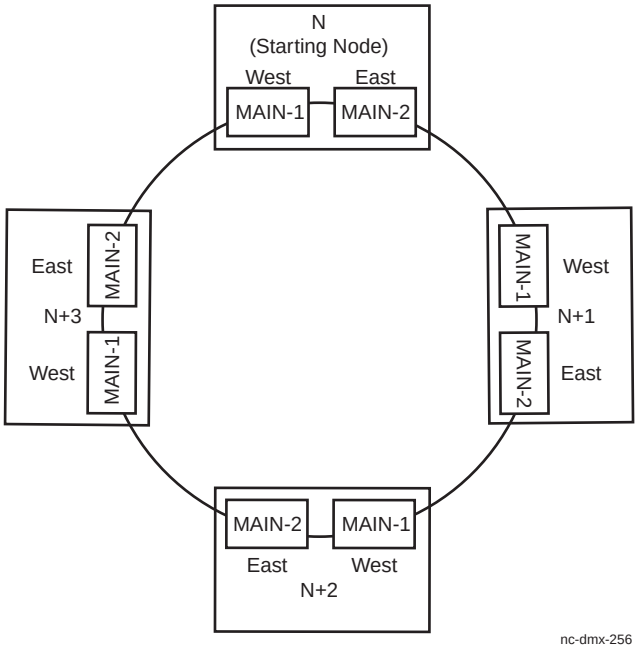
21 At each node in the BLSR as required, select **View** → **Protection** to access the *2F BLSR main-1-1* protection group and click **Select**. Click on the Provisionable Parameters tab and observe the *Automatic Ring Discovery* parameter.

If required, select **Configuration** → **Equipment** to access the *2F BLSR main-1-1* protection group and Enable Automatic Ring Discovery.

END OF STEPS

BLSR example

Figure 12-1 BLSR backout example



Procedure 12-12.1: Back out high-speed BLSR upgrade at node originally equipped with incompatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Incompatible OC-48 OLIU circuit packs include the LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to back out an OC-48 BLSR to OC-192 BLSR upgrade at a node originally equipped with an *incompatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with OC-192 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been replaced with an OC-192 OLIU circuit pack,	Proceed to Step 6.

2 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-12.3: “Verify active/standby status of circuit pack to be replaced” (p. 12-292)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**. Then replace the OC-192 OLIU circuit pack in Main slot **M2** with the original OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be backed out, perform the following to connect the original OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears and the system reports a `Default K-bytes` alarm.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

Note: If **Configuration** → **Update System** → **Upgrade** has not been performed on the current node, proceed to Step 6.

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the original OC-48 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the original optical span between Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span.

6



NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

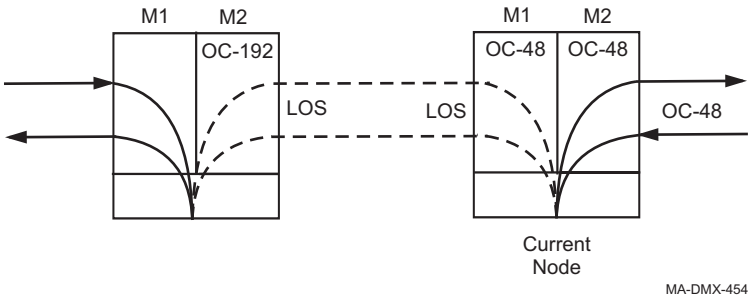
Open a faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M1**. Then replace the OC-192 OLIU circuit pack in Main slot **M1** with the original OC-48 OLIU circuit pack.

Result: The original OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and a `Line Automatic Switch` condition for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the BLSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-12.2: Back out high-speed BLSR upgrade at node originally equipped with compatible OC-48 OLIU in Main slot M2

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! Compatible OC-48 OLIU circuit packs include LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to back out an OC-48 BLSR to OC-192 BLSR upgrade at a node originally equipped with a *compatible* OC-48 OLIU circuit pack in Main slot **M2**.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with OC-192 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been replaced with an OC-192 OLIU circuit pack,	Proceed to Step 7.

2 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-12.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-292)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**. Then replace the OC-192 OLIU circuit pack in Main slot **M2** with the original OC-48 OLIU circuit pack.

Result: A transmission hit will occur after the OC-48 OLIU is inserted. The transmission hit is the result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system reports an `inc. OC192 LOS` alarm, an `unexpected circuit pack type` *condition*, and a `Line Automatic Switch` condition for Main slot **M2**.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be backed out, perform the following to connect the original OC-48 circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarm and `Line Automatic Switch` condition clear. Transmission is now supported on the original OC-48 optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

Note: If **Configuration** → **Update System** → **Upgrade** has not been performed on the current node, proceed to Step 6.

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

6 If required, verify the active/standby status of the OC-192 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-12.3: "Verify active/standby status of circuit pack to be replaced" (p. 12-292)

7 

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M1**. Then replace the OC-192 OLIU circuit pack in Main slot **M1** with the original OC-48 OLIU circuit pack.

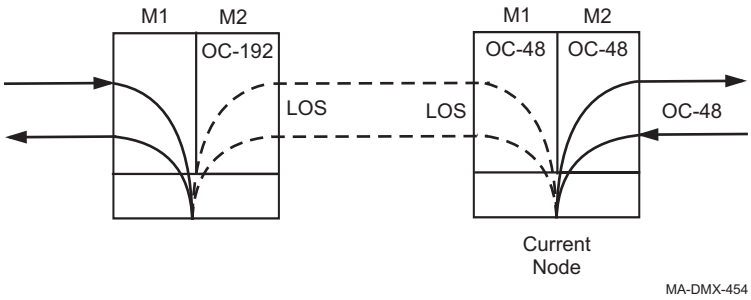
Result: A transmission hit will occur after the OC-192 OLIU is removed. The transmission hit is the result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The original OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and a `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the BLSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-12.3: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

From the System View select **Reports** → **Status Lists** → **Pack**. Click *Shelf* and **Select**. Observe the value of the *Switch State* parameter to determine if the circuit pack to be replaced is active for transmission. Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, an optional manual switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 6 .

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Click on *2F BLSR main-1-1* and **Select**. Select the required Direction for the circuit pack to be replaced (*West* for slot **M1** or *East* for slot **M2**) and *Manual to Protection, Ring* Switch Type, and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and **Close**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the Alarm List shows the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete backing out the BLSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-13: Suspend OC-48 BLSR to OC-192 BLSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to temporarily suspend a OC-48 BLSR to OC-192 BLSR upgrade.

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the ring to their pre-upgrade state, refer to Procedure 12-12: “Back out OC-48 BLSR to OC-192 BLSR upgrade” (p. 12-273).

When the ring upgrade is temporarily suspended before completion, some spans are operating at the OC-48 line rate and some at the OC-192 line rate. This requires two nodes that are equipped with an OC-48 OLIU circuit pack in one Main slot and an OC-192 OLIU circuit pack in the other Main slot. These nodes are the starting node and the last node upgraded.

To continue to operate temporarily with different circuit packs in the Main slots, the starting node and the nodes that have been upgraded must remain in the Ring Upgrade Mode.

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- One original OC-48 OLIU circuit pack if the upgrade is suspended at an upgraded node originally equipped with LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs
- One LNW27 (Series 1:6 and later) or LNWUPG OC-48 OLIU circuit pack (temporarily required if the upgrade is suspended at a partially upgraded node originally equipped with LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs)

  The LNWUPG OC-48 OLIU circuit pack is a special LNW27 OC-48 OLIU circuit pack that is intended for use only as the temporary transition circuit pack. There are no differences between the LNW27 (Series 1:6 and later) and LNWUPG circuit packs with respect to in-service backouts/suspends.

  The LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs may also be used as the temporary replacement circuit packs. However, the temporary replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long range optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this suspend procedure.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to temporarily suspend an OC-48 BLSR to OC-192 BLSR upgrade.

1 Identify the last node that was upgraded.

If...	Then...
both Main slots have been upgraded,	Log in to the last node upgraded (refer to the "BLSR example" (p. 12-302) at the end of the procedure) and continue with Step 2.
one Main slot has been upgraded and the node was originally equipped with LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs	Log in to the last node upgraded (refer to the "BLSR example" (p. 12-302) at the end of the procedure) and proceed to Step 8.
one Main slot has been upgraded and the node was originally equipped with LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs	Log in to the last node upgraded (refer to the "BLSR example" (p. 12-302) at the end of the procedure) and proceed to Step 11.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 **Important!** Both Main slots have been upgraded and the system is reporting an `inc. OC192 LOS` alarm and a `Line Automatic Switch` condition for Main slot **M2**.

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the OC-192 OLIU circuit pack in Main slot **M2**.

If the local operating procedures specify...	Then...
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 6.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 3.

3 **Important!** This step is optional. If the OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the OC-192 OLIU circuit pack in Main slot **M2**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

4 **Important!** This step is optional. If the OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-192 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

5 If required, repeat Step 3 to verify that the circuit pack in Main slot **M1** is now the active circuit pack for timing.

6 Open the lower faceplate latch on the OC-192 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-192 OLIU circuit pack in Main slot **M2**.

If the Main slots were originally equipped with...	Then replace the OC-192 OLIU circuit pack in Main slot M2 with...
LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, or LNW221–259 (pre Series 1:6) OC-48 OLIUs,	the temporary replacement OC-48 OLIU circuit pack.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIUs,	the original OC-48 OLIU circuit pack

Result: The OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system still reports an `inc. OC192 LOS` alarm and `Line Automatic Switch` condition for Main slot **M2**. The system also reports an `unexpected circuit pack type` condition for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

7 At both ends of the optical span, perform the following to connect the OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarm and `Line Automatic Switch` condition for Main slot **M2** clear, and the system still reports an `unexpected circuit pack type` condition for Main slot **M2**.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the OC-48 OLIU circuit pack in Main slot **M2** with the OC-192 OLIU circuit pack. Refer to Procedure 12-11: “Upgrade OC-48 BLSR to OC-192 BLSR” (p. 12-236).

To back out the upgrade, refer to Procedure 12-12: “Back out OC-48 BLSR to OC-192 BLSR upgrade” (p. 12-273).

8 **Important!** Main slot **M1** has been upgraded and the node was originally equipped with LNW26B, LNW27 (pre Series 1:6), LNW28, LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), LNW77, LNW121B–159B, or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit packs.

If an `unexpected CP type` alarm is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, proceed to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm and `Line Automatic Switch` condition for Main slot **M1** clear, and the system reports an `unexpected CP type` alarm and `Line Automatic Switch` condition for Main slot **M2**.

9 Open the lower faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement OC-48 OLIU circuit pack.

Result: The temporary replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M2** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 At both ends of the optical span, perform the following to connect the temporary replacement OC-48 OLIU circuit pack in Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarm for Main slot **M2** clears, and the system still reports an `unexpected circuit pack type` condition for Main slot **M2**.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M2** with the OC-192 OLIU circuit pack. Refer to Procedure 12-11: “Upgrade OC-48 BLSR to OC-192 BLSR” (p. 12-236).

To back out the upgrade, refer to Procedure 12-12: “Back out OC-48 BLSR to OC-192 BLSR upgrade” (p. 12-273).

11 **Important!** Main slot **M1** has been upgraded and the node was originally equipped with LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW82, LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit packs.

If an `unexpected circuit pack type` condition is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, the node is already in the proper suspend configuration and no further action is required.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M2**.

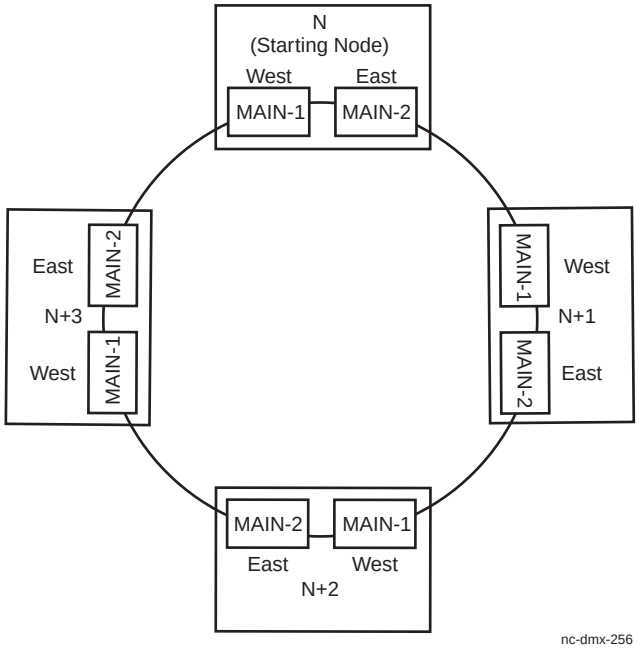
STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the OC-48 OLIU circuit pack in Main slot **M2** with the OC-192 OLIU circuit pack. Refer to Procedure 12-11: “Upgrade OC-48 BLSR to OC-192 BLSR” (p. 12-236).

To back out the upgrade, refer to Procedure 12-12: “Back out OC-48 BLSR to OC-192 BLSR upgrade” (p. 12-273).

END OF STEPS

BLSR example



Procedure 12-14: Upgrade OC-3 or OC-12 UPSR to a Alcatel-Lucent 1665 DMX OC-48/192 UPSR

Overview

Use this procedure to perform an in-service upgrade of an existing DDM-2000 OC-3 or OC-12 UPSR, refer to Figure 12-2, "Initial configuration for upgrade" (p. 12-305), to a Alcatel-Lucent 1665 DMX OC-48/192 UPSR. This procedure establishes a final configuration, refer to Figure 12-8, "Final configuration in upgrade sequence" (p. 12-316), with the Alcatel-Lucent 1665 DMX OC-48/192 UPSR serving as a backbone ring for the subtending OC-3/12 ring.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required:

- Wrist strap
- Optical power meter, to measure the level of received power
- Appropriate optical LBOs
- Technical assistance at the two (East and West) adjacent nodes.

  Important! All nodes in the existing network must have the same software release before upgrading the network.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Notify the maintenance center of these planned upgrade activities and that alarms will be generated.
3. At each DDM-2000 OC-3 or OC-12 UPSR node, verify that no alarms, lockouts, loopbacks, or switches are present. Refer to the DDM-2000 User Service Manual (USM) if you need additional instruction. Any existing alarms must be cleared before starting this procedure.
4. This procedure is used to update a DDM-2000 OC-3/12 UPSR to a Alcatel-Lucent 1665 DMX OC-48/192 UPSR. It is assumed that the fiber being used in the current OC-3/12 ring will be used to build the new Alcatel-Lucent 1665 DMX UPSR.

5. With minor changes, this procedure may also be used to move VT1.5 service onto an existing OC-48/192 ring. The fiber connecting the OC-48/192 nodes at each site would already be connected and the OC-48/192 ring would already be carrying service.
6. This procedure uses an existing 3 node DDM-2000 OC-3/12 ring as an example for the OC-3/12 to OC-48/192 ring upgrade. See Figure 12-2, “Initial configuration for upgrade” (p. 12-305). Other OC-3/12 network upgrades are possible and can be done using this procedure with minor modifications. Local procedures will have to be written, using the concepts of this procedure, to upgrade the particular configuration that you have.
7. This procedure assumes that a Alcatel-Lucent 1665 DMX has been installed and equipped, refer to Procedure 5-1: “Equip new Alcatel-Lucent 1665 Data Multiplexer for Add/Drop Multiplexer (ADM) applications” (p. 5-3), at each existing OC-3/12 shelf location. The Alcatel-Lucent 1665 DMX shelf must be equipped with Main OLIUs and OC-3/12 OLIUs (in the Function Group or Growth slots being used to connect to the DDM-2000).
8. The application parameter of the OC-3/12 interfaces on the Alcatel-Lucent 1665 DMX must be set to **0x1** (Release 2 and earlier) or **UPSR** in Release 3 or later.

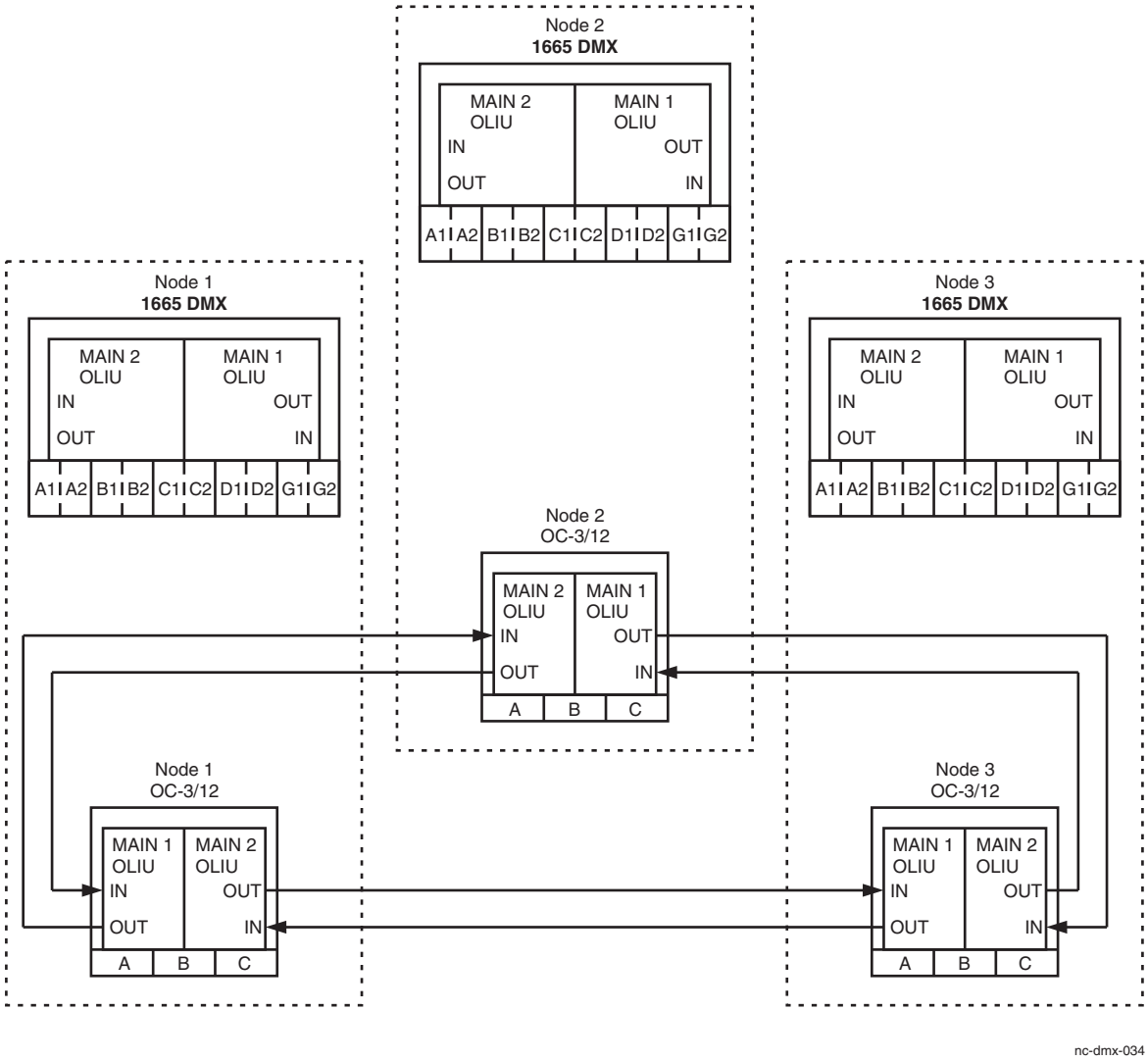
   Note that in Release 3 or later, the **0X1** application parameter is no longer valid, and you have to use the **UPSR** application parameter for this configuration. A new parameter has been added to the cross-connection command to accomplish the function of 0X1 application. The new cross-connection parameter is channel application (**chappl**), with a value of **UNSWITCHED**.
9. TARP Release 15 or later ring software must be installed on the DDM-2000 shelves.
10. You may also contact Alcatel-Lucent to perform this in-service upgrade. Experienced Alcatel-Lucent installers will help you plan and execute the network upgrade. For more information, contact your Alcatel-Lucent Account Representative.

Steps

Complete the following steps to convert an in-service OC-3/12 UPSR to a Alcatel-Lucent 1665 DMX OC-48/192 UPSR.

1 Reference Figure 12-2, “Initial configuration for upgrade” (p. 12-305) as the starting point for this procedure.

Figure 12-2 Initial configuration for upgrade



2 At each Alcatel-Lucent 1665 DMX node, connect the PC and establish a *WaveStar*® CIT session.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

3 At each Alcatel-Lucent 1665 DMX node, select **Configuration** → **DCC Terminations** to verify/set Network Side/User Side parameters at each end of the optical span being established.

Refer to the DDM-2000 user manual to verify/set NS/US parameters for this configuration.

Note that if the default settings were not changed in the DDM-2000 ring configuration and the default settings are retained in the Function or Growth slots of the Alcatel-Lucent 1665 DMX node, no changes should be required.

Important! The requirement is that one end of the optical fiber connection must be set to Network-Side and the other end must be set to User-Side.

4 Refer to office records and verify that no duplicate TID settings exist among the existing network nodes and the new network nodes.

Important! If duplicate TIDs exist, they must be resolved before continuing. As appropriate, refer to Procedure 7-11: "Set/change system TID" (p. 7-36) to change a Alcatel-Lucent 1665 DMX TID. Or, to the User Service Manual of the OC-3/12 subtending shelf.

If you need additional instructions to help you complete this step on the DDM-2000 NEs, refer to the DDM-2000 documentation.

5 At the Alcatel-Lucent 1665 DMX Nodes (1, 2, and 3 in this example) select **Configuration** → **Provision** to verify/set the **Application** parameter to 0x1 (Release 2 and earlier) or **UPSR** (Release 3 and later) for the OC-3 or OC-12 interfaces that are being used for this single-homed configuration.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

6 At each of the Alcatel-Lucent 1665 DMX host nodes (nodes 1, 2, and 3 in this example), determine and provision the add/drop cross-connections to support each single-homed OC-3 or OC-12 node. From the System View menu, select **Configuration** → **Cross-Connections** to start the *Cross-Connection Wizard*. Refer to Procedure 10-8: "Make single-homed cross-connections" (p. 10-34).

Important! Refer to the OLIU circuit pack descriptions in the descriptive chapters of this document to find the cross-connection capacities for Virtual Tributaries (VTs) for the OLIU circuit packs in the Alcatel-Lucent 1665 DMX.

Any channels that are presently in service or cross-connected in the existing DDM-2000 ring must be cross-connected to the single-homed Function or Growth group OLIUs in the Alcatel-Lucent 1665 DMX nodes.

In the case of a VT1.5 signal, the same STS-1 may be cross-connected to the OC-3/12 shelves at several Alcatel-Lucent 1665 DMX nodes until the STS-1 signal reaches its capacity of 28 VT1.5 signals.

In Release 3 or later, note that the single-homed cross-connections to the DDM-2000 shelves must be cross-connected in the Alcatel-Lucent 1665 DMX from the main OLIUs to the Function or Growth OLIUs using the cross-connection parameter of **`chappl`**=**`UNSWITCHED`**.

The connection between the DDM-2000 and Alcatel-Lucent 1665 DMX is a single-homed connection. In single-homed connections, the Function Group slot A1, B1, C1, D1, or Growth slot G1 OLIU in the Alcatel-Lucent 1665 DMX host shelf connects to the M1 OLIU at the first DDM-2000 shelf from the Alcatel-Lucent 1665 DMX host shelf. M2 OLIU at the first DDM-2000 shelf connects to Function Group slot A2, B2, C2, D2, or Growth slot G2 OLIU in the Alcatel-Lucent 1665 DMX host shelf. This procedure establishes the ring configuration starting from the Alcatel-Lucent 1665 DMX host node to the far-end DDM-2000 shelf and back to the host node.

7 At each Alcatel-Lucent 1665 DMX shelf, determine the channels to be pass-through cross-connected in the Alcatel-Lucent 1665 DMX. Select **Configuration** → **Cross-Connections** at each required Alcatel-Lucent 1665 DMX shelf to make all required pass-through cross-connections for the previously selected channels.

Important! At each Alcatel-Lucent 1665 DMX node in the ring, pass-through cross-connections must be made for each channel that is carrying traffic and that has not been cross-connected to a circuit pack in a Function or Growth slot in that Alcatel-Lucent 1665 DMX node. Critical or Major alarms will be generated if pass-through cross-connections are not made on each required Alcatel-Lucent 1665 DMX shelf in the ring.

Note that in the examples in this procedure there are no pass-through Alcatel-Lucent 1665 DMX nodes. All the Alcatel-Lucent 1665 DMX nodes serve as host nodes to support the single homed configuration. As an example, if another Alcatel-Lucent 1665 DMX node was placed between Alcatel-Lucent 1665 DMX Node 1 and Node 2, then you would provision the necessary pass-through cross-connections at that node.

8 At all Alcatel-Lucent 1665 DMX shelves in the network, select **Configuration** → **Timing/Sync** and click on the tab labeled System Timing and for the box that is labeled Synchronization Autoreconfiguration select option disabled.

Important! Sync auto-reconfiguration is disabled during this upgrade to avoid timing hits and unnecessary alarms. After the upgrade is completed, it is recommended that sync auto-reconfiguration be enabled at all nodes in the network.

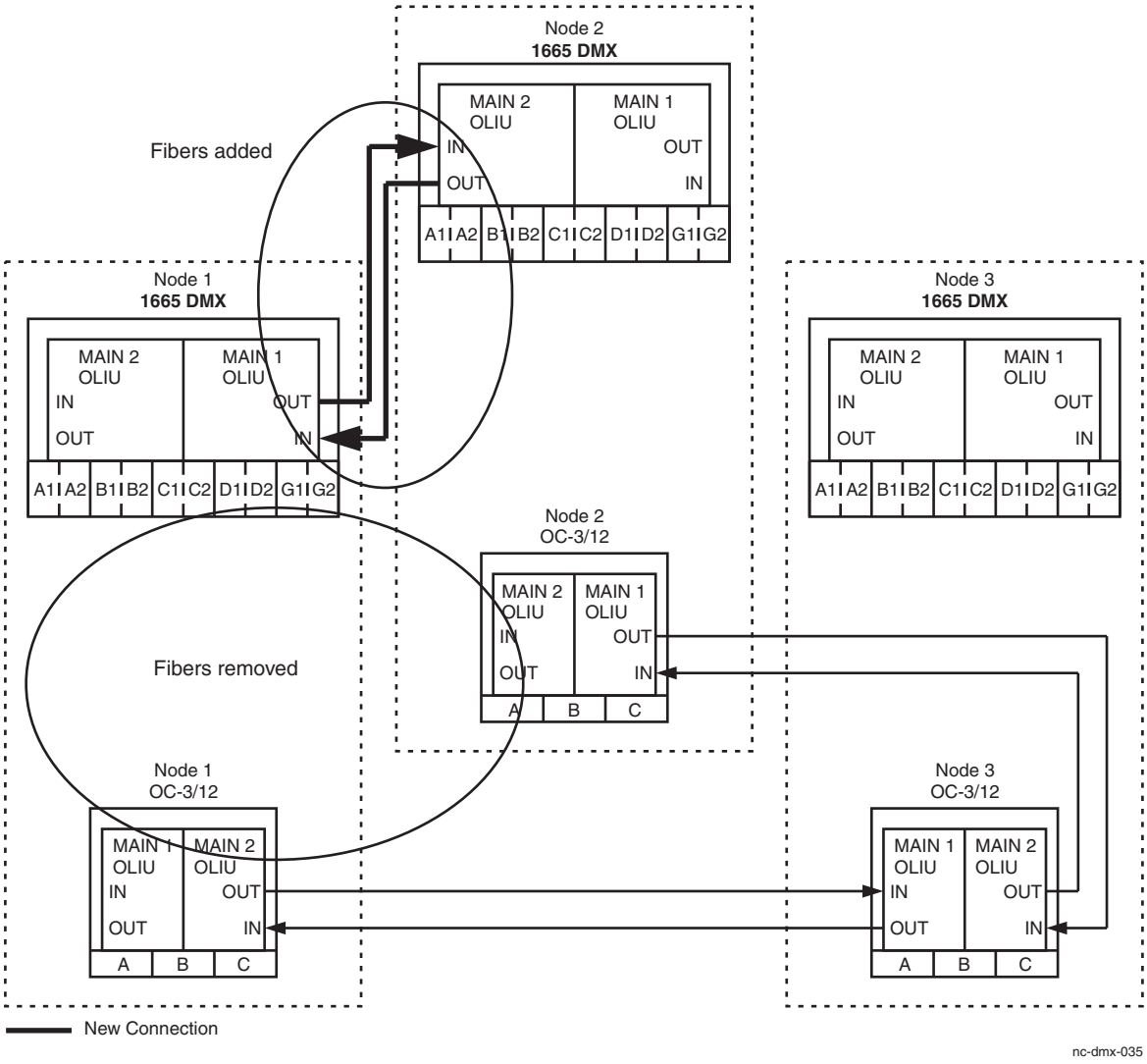
9 As appropriate, at each Alcatel-Lucent 1665 DMX node, select **Configuration** → **DCC Terminations** and for the field DCC Channel Parameter Termination State select option enabled.

Important! An inconsistent DCC values alarm occurs when the Alcatel-Lucent 1665 DMX OLIUs are looped back and fecom is enabled. The alarm clears as the OLIU loopbacks are removed and the Alcatel-Lucent 1665 DMX and DDM-2000 shelves are interconnected.

10 Starting at any location, disconnect the fiber pair between one DDM-2000 shelf and a neighboring DDM-2000 shelf.

For example, in Figure 12-3, “First figure in upgrade sequence” (p. 12-309), disconnect the fiber pairs between DDM-2000 Node 1 and DDM-2000 Node 2. If required, use these fibers to connect Alcatel-Lucent 1665 DMX Node 1 and Alcatel-Lucent 1665 DMX Node 2.

Figure 12-3 First figure in upgrade sequence



Important! A protection switch may occur when fibers are removed and cause a transmission hit. This procedure begins at one location and progresses around the ring until all optical fiber connections are made.

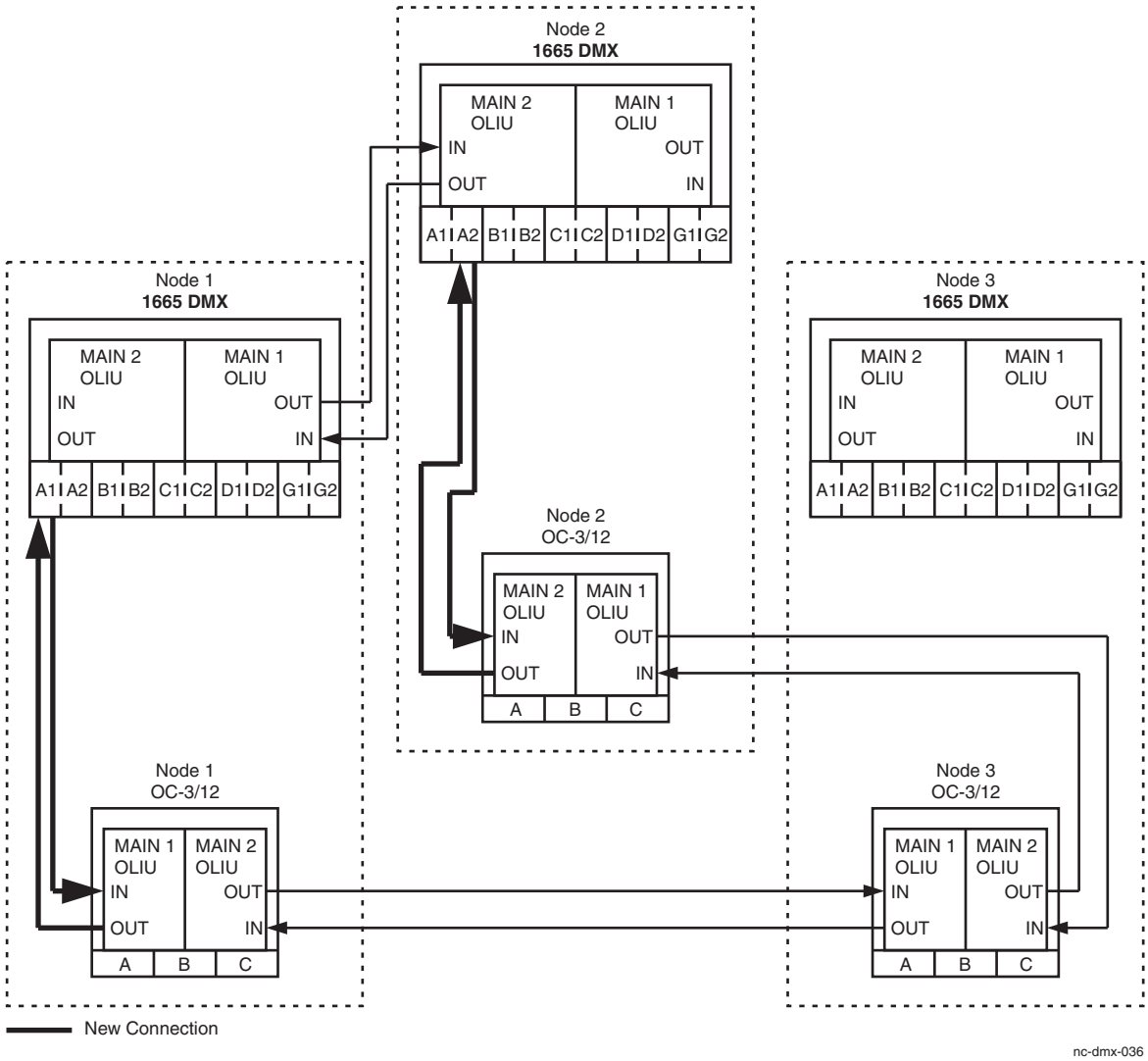
Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

11 At Alcatel-Lucent 1665 DMX Node 1, connect the optical fibers from DDM-2000 Node 1 MAIN1 slot to Alcatel-Lucent 1665 DMX Function Group Slot A1, B1, C1, D1, or Growth slot G1. See Figure 12-4, “Second figure in upgrade sequence” (p. 12-310).

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

12 At Alcatel-Lucent 1665 DMX Node 2, connect the optical fibers from DDM-2000 Node 2 MAIN2 slot to Alcatel-Lucent 1665 DMX Function Group Slot A2, B2, C2, D2, or Growth slot G2. See Figure 12-4, “Second figure in upgrade sequence” (p. 12-310).

Figure 12-4 Second figure in upgrade sequence

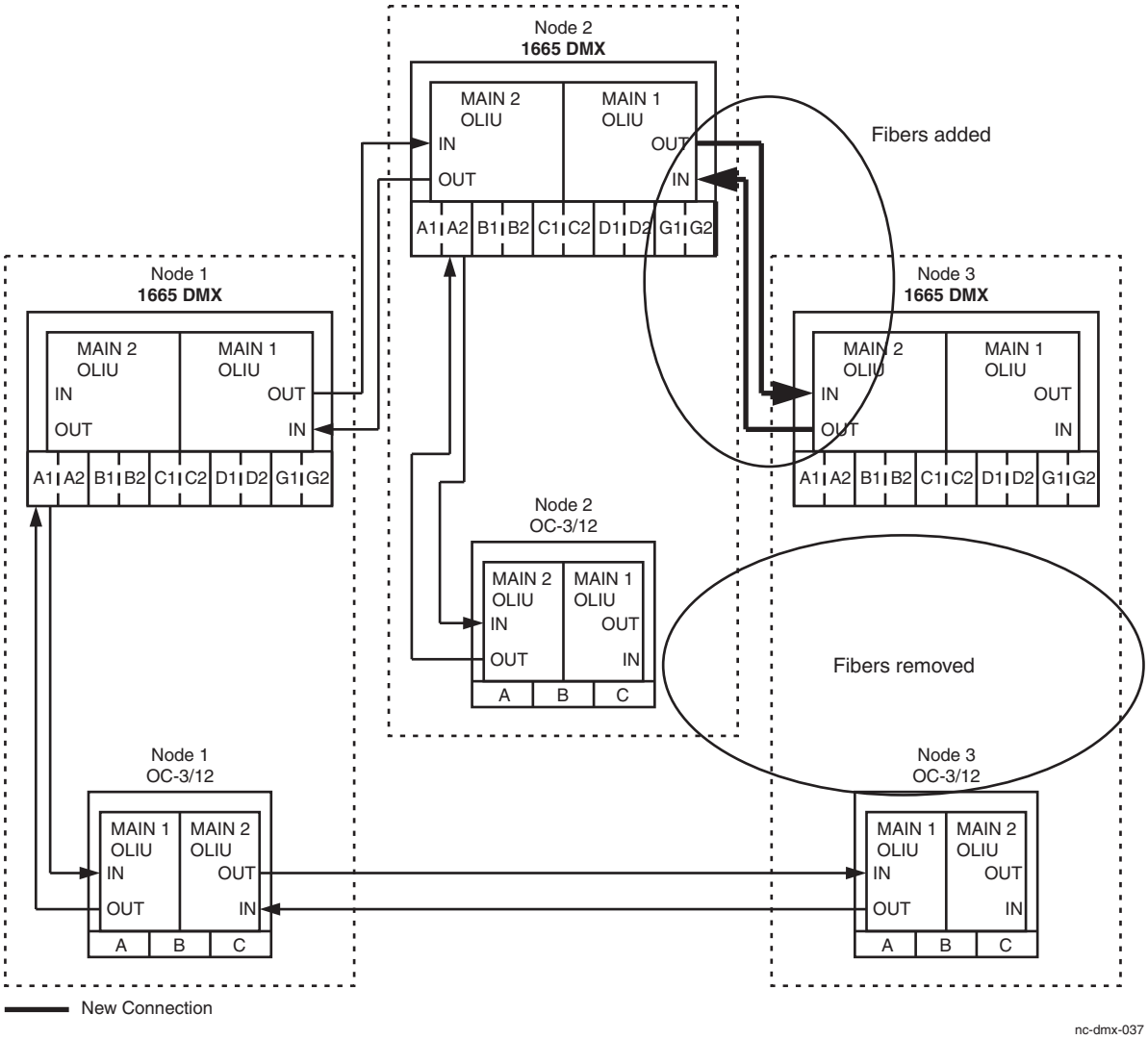


Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

13 Click on the Alarm List button and verify that no alarms are being reported for channels that are connected between MAIN-1 of the DDM-2000 shelf at Node 1 (through the Alcatel-Lucent 1665 DMXs at Nodes 1 and 2) and MAIN-2 of the DDM-2000 at Node 2. If there are any alarms, recheck the cross-connections at the Alcatel-Lucent 1665 DMXs.

14 See Figure 12-5, "Third figure in upgrade sequence" (p. 12-311). Disconnect the fiber pair between DDM-2000 Nodes 2 and 3. If required, use these fibers to connect Alcatel-Lucent 1665 DMX Node 2 and Node 3.

Figure 12-5 Third figure in upgrade sequence



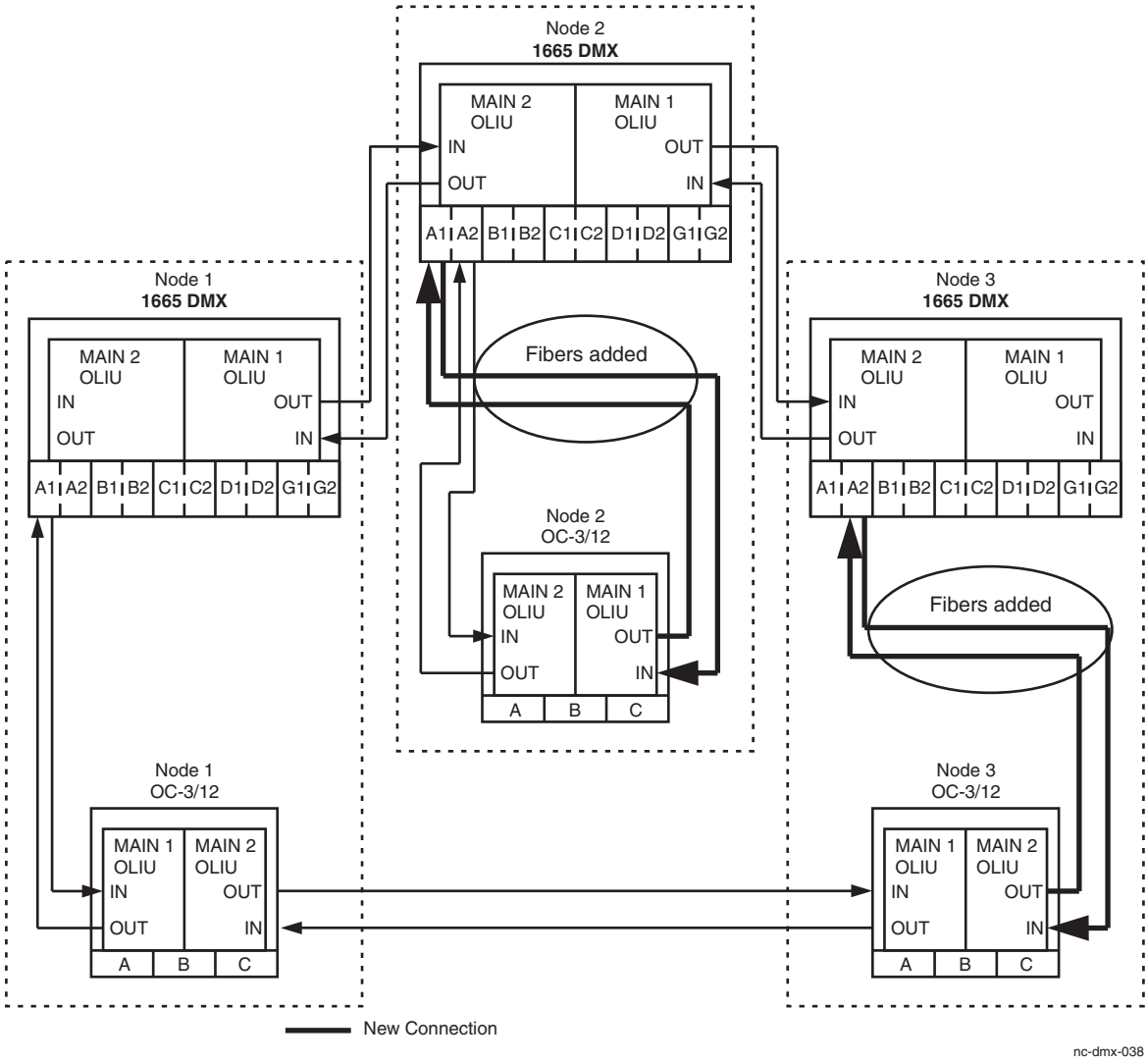
Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

15 See Figure 12-6, “Fourth figure in upgrade sequence” (p. 12-313). At Alcatel-Lucent 1665 DMX Node 2, connect the optical fibers from DDM-2000 Node 2 MAIN1 slot to Alcatel-Lucent 1665 DMX Function Group slot A1, B1, C1, D1, or Growth slot G1.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

16 At Alcatel-Lucent 1665 DMX Node 3, connect the optical fibers from DDM-2000 Node 3 MAIN2 slot to Alcatel-Lucent 1665 DMX Function Group slot A2, B2, C2, D2, or Growth slot G2. See Figure 12-6, “Fourth figure in upgrade sequence” (p. 12-313).

Figure 12-6 Fourth figure in upgrade sequence

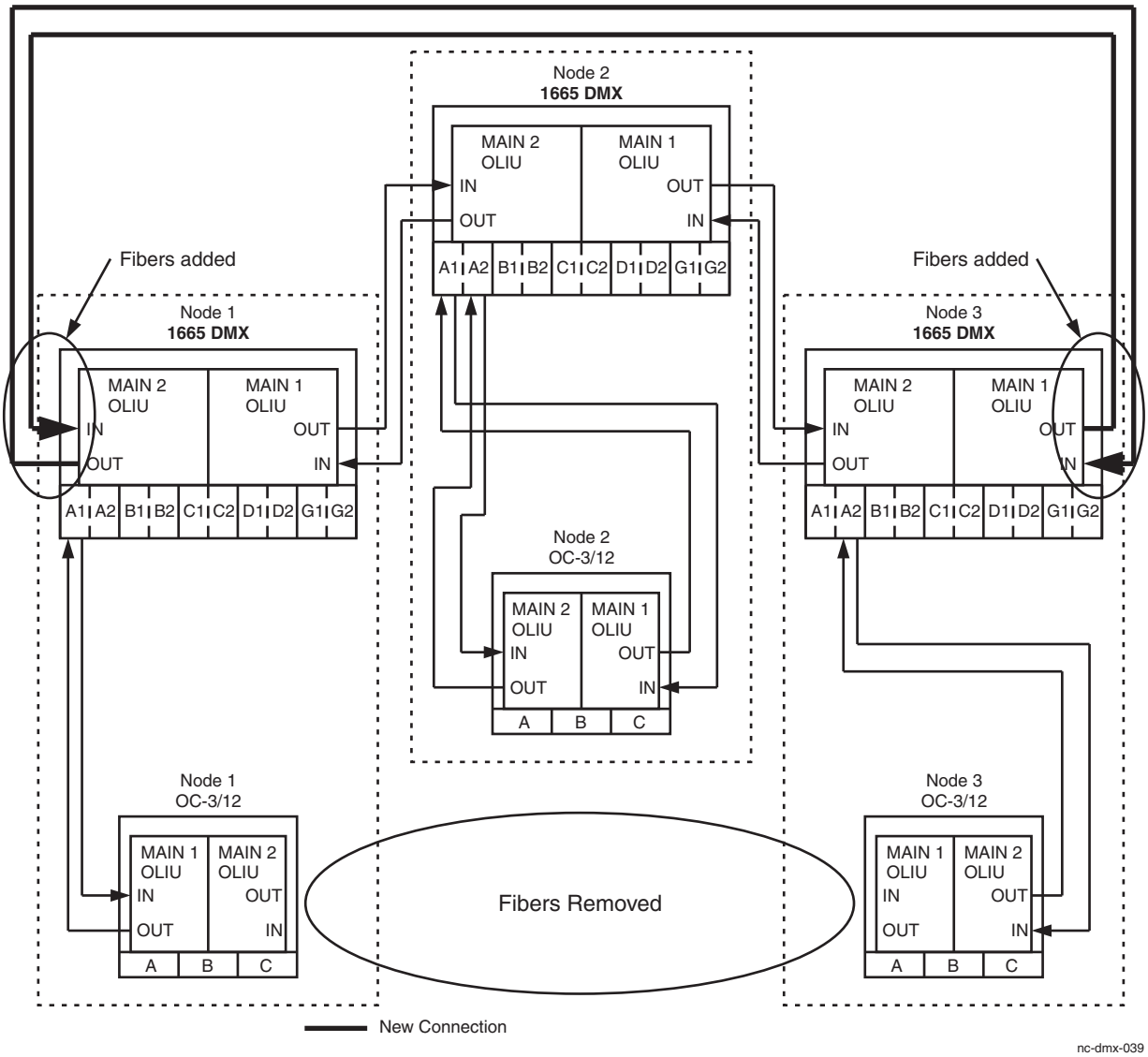


Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

17 Click on the Alarm List button and verify that no alarms are being reported for channels that are connected between MAIN-1 of the DDM-2000 shelf at Node 2 (through the Alcatel-Lucent 1665 DMXs at Nodes 2 and 3) and MAIN-2 of the DDM-2000 at Node 3. If there are any such alarms, recheck the cross-connections at the Alcatel-Lucent 1665 DMXs.

18 See Figure 12-7, “Fifth figure in upgrade sequence” (p. 12-314). Disconnect the fiber pair between DDM-2000 Nodes 2 and 3. If required, use these fibers to connect Alcatel-Lucent 1665 DMX Nodes 1 and 3.

Figure 12-7 Fifth figure in upgrade sequence



Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

19 See Figure 12-8, “Final configuration in upgrade sequence” (p. 12-316). At Alcatel-Lucent 1665 DMX Node 3, connect the optical fibers from DDM-2000 Node 3 MAIN1 slot to Alcatel-Lucent 1665 DMX Function Group slot A1, B1, C1, D1, or Growth slot G1.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

20 At Alcatel-Lucent 1665 DMX Node 1, perform the optical fiber connections from DDM MAIN2 slot to Alcatel-Lucent 1665 DMX Function Group Slot A, B, C, D, or G 2. See Figure 12-8, “Final configuration in upgrade sequence” (p. 12-316).

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

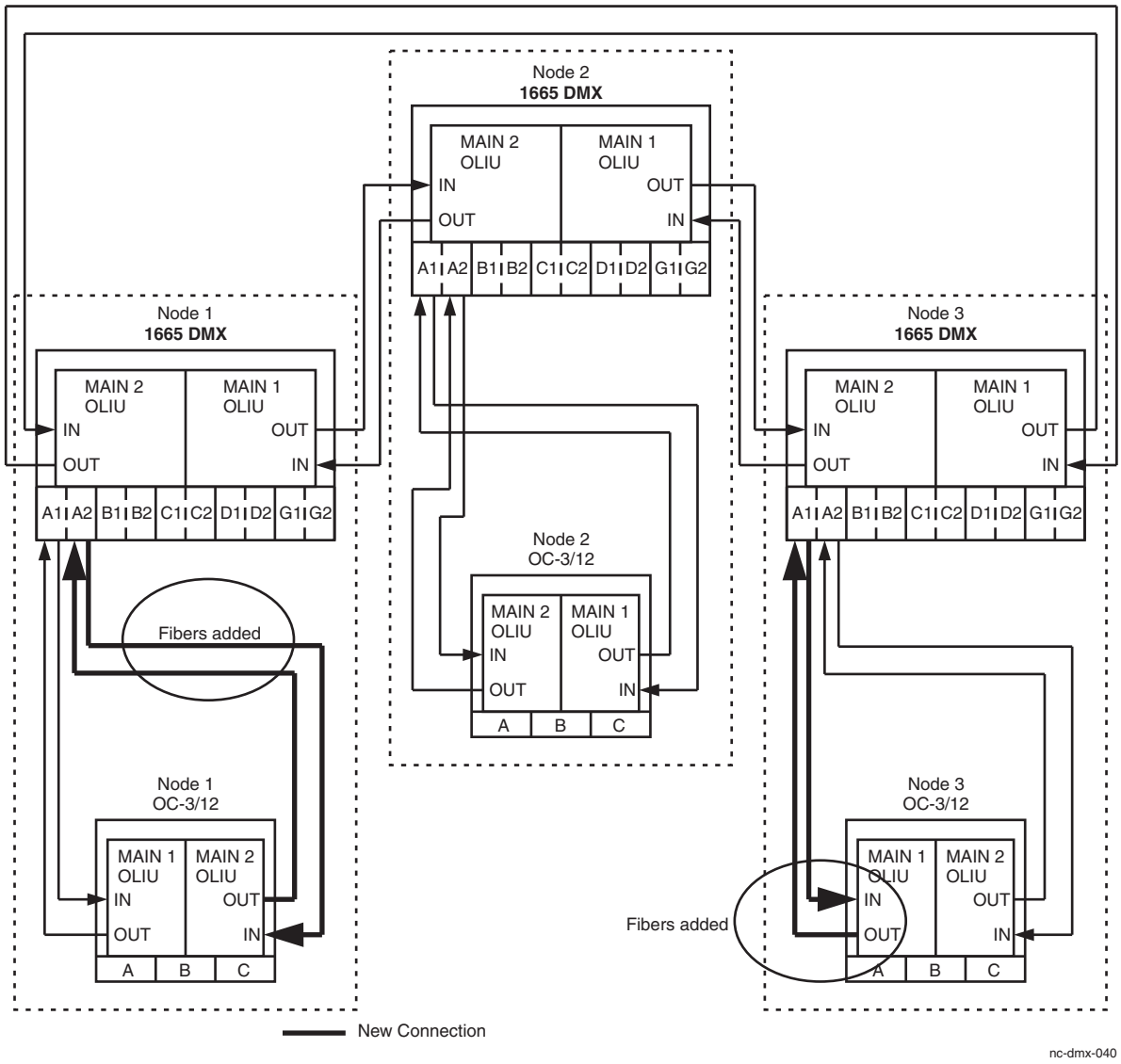
21 Click on the Alarm List button and verify that no alarms are being reported for channels that are connected between MAIN-1 of the DDM shelf at Node 3 (through the Alcatel-Lucent 1665 DMXs at Nodes 3, 2, and 1) and MAIN-2 of the DDM at Node 1. If there are any such alarms, recheck the cross-connections at the Alcatel-Lucent 1665 DMXs.

22 Refer to the work instructions and determine the timing/synchronization plan for each node. Select **Configuration** → **Timing/Sync** from the System View menu at each node. Click on the tab that is labeled System Timing and select the appropriate options for that particular node.

Important! The simplest timing configuration would be to set one Alcatel-Lucent 1665 DMX node to receive external timing from the BITS clock, and all other nodes in the network to receive line timing. Many other timing configurations are possible.

23 At any one of the Alcatel-Lucent 1665 DMX nodes select **Administration** → **OSI Routing Map** in order to verify that the UPSR is functional.

Figure 12-8 Final configuration in upgrade sequence



END OF STEPS

Procedure 12-15: Upgrade low-speed electrical circuit packs

Overview

Use this procedure to upgrade the following in-service low-speed electrical circuit packs in a function unit.

- LNW6 28DS1 to high-density LNW8 56DS1/E1
- LNW7 28DS1PM to high-density LNW8 56DS1/E1
- LNW16 12DS3/EC1 to high-density LNW19/LNW19B 48DS3/EC1

Note: To upgrade LNW7 28DS1PM to high-density LNW801 56DS1/E1 (service affecting), Procedure 12-38: "Upgrade low-speed LNW7 to LNW801 circuit packs" (p. 12-684).

To upgrade LNW16 12DS3/EC1, LNW18 12TMUX, or LNW19/19B 48DS3/EC1 to LNW20 48TMUXDS3EC1 circuit packs, refer to Procedure 12-29: "Upgrade TMUX/DS3/EC1 to LNW20 48TMUXDS3EC1 circuit pack" (p. 12-528).

Important! The high-density circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The standard Alcatel-Lucent 1665 DMX Shelf does not support the high-density circuit packs. If a high-density circuit pack is installed in the standard Alcatel-Lucent 1665 DMX Shelf, the system will not recognize the circuit pack as an allowable type.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Important! The system does not support mixing standard density and high-density circuit packs in the same Function unit. Both slots of a Function unit must be equipped with the same circuit pack type.

Important! An upgrade from an LNW6/7 to an LNW8 is denied if either of the following situations occur:

- Available VT resources are not sufficient to support the cross-connections to the LNW8.
- The upgrade would result in a source and destination conflict of VT bandwidth. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for more information about the assignment of VT bandwidth.
- One or more of the LNW6 or LNW7 tributaries is cross-connected only as the source of a cross-connection

Important! If an LNW19 48DS3/EC1 circuit pack and an LNW19B 48DS3/EC1 circuit pack are installed in the same Function unit, then *both* circuit packs function as an LNW19 48DS3/EC1 circuit pack. Therefore, the LNW19B 48DS3/EC1 circuit pack would *not* support DS3 terminal loopbacks.

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Two replacement high-density circuit packs for each Function unit to be upgraded.

Release 3.1 or later software is required to support the high-density LNW8 56DS1/E1 and LNW19 48DS3/EC1 circuit packs.

Release 5.0 or later software is required to support the high-density LNW19B 48DS3/EC1 circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure, and verify that the affected circuit pack/protection group AIDs are specified.

3. Verify that the circuit packs to be upgraded are protected. Both Function unit slots (**A**,**B**,**C**,**D**)**1** and (**A**,**B**,**C**,**D**)**2** must be equipped before performing this procedure. If necessary, install the companion circuit pack. Refer to Procedure 4-6: "Install DS3/EC1 circuit packs" (p. 4-40) or Procedure 4-8: "Install DS1/E1 circuit packs" (p. 4-47).
4. Verify that the DS1 and/or DS3 cables necessary to support the high-density circuit packs have already been installed. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304* for cabling information.
5. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.

Steps

Complete the following steps to upgrade the in-service low-speed electrical circuit packs in a function unit.

1 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

4

If upgrading...	Then...
DS1 circuit packs,	Continue with Step 5.
DS3/EC1 circuit packs,	Proceed to Step 6.

5 **Important!** When the standard density DS1 circuit pack in slot (**A**, **B**, **C**, **D**) **2** is removed, transmission hits occur causing the system to report the `inc. (from DSX) DS1 sig. failed` condition. Depending on the provisioned value of the DS1 port *Signal Failure Threshold*, it may take up to 20 minutes for the `inc. (from DSX) DS1 sig. failed` condition to automatically clear. It is recommended that the DS1 port *Signal Failure Threshold* be provisioned *10E-3* to minimize the time it takes the system to clear the condition. The original DS1 port *Signal Failure Threshold* can be reprovisioned when the upgrade is complete.

From System View select **Reports** → **Equipment Lists** → **Port**. Click on the DS1 circuit pack in slot (**A**,**B**,**C**,**D**)**2** and **Select**. Record the *Signal Failure Threshold* of each DS1 port. If required, provision the *Signal Failure Threshold* of the DS1 ports to *10E-3*.

Reference: Procedure 4-9: "Provision DS1/E1 circuit packs/ports for service" (p. 4-50)

6 **Important!** Local operating procedures for removing a circuit pack may vary. One method is to simply remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the circuit pack in slot (**A**, **B**, **C**, **D**) **1**.

If the local operating procedures specify...	Then...
remove the circuit pack,	Proceed to Step 9.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then remove the circuit pack,	Continue with Step 7.

7 **Important!** The circuit pack in slot (**A**, **B**, **C**, **D**) **1** must be replaced first. Perform this step to determine if the circuit pack in slot (**A**, **B**, **C**, **D**) **1** is active for transmission.

From the System View select **Reports** → **Status Lists** → **Pack**. Click on *Shelf* and **Select**. Observe the value of the *Switch State* parameter for the required *fn-{a,b,c,d}-1* circuit pack (according to the work instructions). If the *Switch State* parameter is *active*, the circuit pack in slot (**A**, **B**, **C**, **D**) **1** is the active circuit pack for transmission. Click **Close**.

8 **Important!** This step is optional. If the circuit pack in slot (**A**, **B**, **C**, **D**) **1** is the active circuit pack for transmission, then a manual switch must be performed before replacing the circuit pack.

If the circuit pack in slot (**A**, **B**, **C**, **D**) **2** is the active circuit pack for transmission, do *not* perform this step.

To perform a manual transmission switch, select **Fault** → **Protection Switch**. Click on the required *1+1 Equip* protection group (according to the work instructions) and **Select**. Select the *Manual (Normal)* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**. Then click **Close**.

9 Replace the circuit pack in slot (**A**, **B**, **C**, **D**) **1** with the replacement high-density circuit pack.

Result: If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` slot conditions when the replacement high-density circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected CP type` alarm for slot (**A**, **B**, **C**, **D**) **1**.

If a circuit pack firmware update is not required, the system reports an `unexpected CP type` alarm for slot (**A**,**B**,**C**,**D**)**1** when the replacement high-density circuit pack is inserted.

10 **Important!** The **UPD/INIT** button does not work during this upgrade.

From the System View select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement high-density circuit pack in slot (**A**, **B**, **C**, **D**) **1** is autoprovisioned, and the system performs an automatic circuit pack protection switch. Traffic is automatically switched from the circuit pack in slot (**A**, **B**, **C**, **D**) **2**, to the circuit pack in slot (**A**, **B**, **C**, **D**) **1**.

If upgrading DS1 circuit packs, transmission hits (up to 130 ms) occur as the automatic switches are performed.

All traffic is now active on the circuit pack in slot (**A**, **B**, **C**, **D**) **1**.

The `unexpected CP type` alarm for slot (**A**, **B**, **C**, **D**) **1**, clears, and the system reports an `CP not allowed - eqpt` alarm for slot (**A**, **B**, **C**, **D**) **2**.

11 **Important!** When a standard density LNW6 28DS1 or LNW7 28DS1PM circuit pack is removed from slot (**A**, **B**, **C**, **D**) **2**, transmission hits occur causing the system to report and automatically clear the `inc. (from DSX) DS1 sig. failed` condition.

Replace the other circuit pack in the companion slot (**A**, **B**, **C**, **D**) **2** with the replacement high-density circuit pack.

Result: The replacement high-density circuit pack in slot (**A**, **B**, **C**, **D**) **2** is autoprovisioned and all alarms clear.

12 From the System View select **View** → **Refresh System View** to update the graphical circuit pack and port information currently displayed for the network element.

Result: A warning message appears asking you to confirm executing this command. Click **Yes**.

The graphical circuit pack and port information displayed in the System View is updated to show the replacement high-density circuit packs and additional ports.

13

If upgrading...	Then...
DS1 circuit packs,	Continue with Step 14.
DS3/EC1 circuit packs,	Proceed to Step 15.

14 If required, provision the *Signal Failure Threshold* of the DS1 ports to the original values recorded in Step 5.

Reference: Procedure 4-9: “Provision DS1/E1 circuit packs/ports for service” (p. 4-50)

15 This completes the low-speed electrical circuit pack upgrade in a Function unit. If the low-speed electrical circuit packs in other Function units are to be upgraded at this node, repeat Step 4 through Step 14; otherwise, continue with the next step.

16 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)

END OF STEPS

Procedure 12-16: Upgrade or replace SYSCTL (LNW2) circuit pack

Overview

Use this procedure to upgrade/replace a SYSCTL (LNW2) circuit pack in an in-service shelf.

If you wish to upgrade an LNW1 to an LNW2, you must use either Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62) or Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93).

Important! Performing this procedure under the following scenarios may cause transmission losses and/or require a restore from a remote backup file.

- While the SYSCTL is removed, DO NOT remove or replace either Main circuit pack (M1, M2).
- If an equipped Main (M1 or M2) is removed from the NE, DO NOT replace the SYSCTL.

Required equipment

The following equipment is required:

- At least one of the following cables:
  - RS-232 cable with an RJ-45 connector on one end and a PC serial connector on the other (typically DB9) for the **RS232** port
  - CAT5 Ethernet cable with either a 10/100 hub or a cross-over cable for the front **LAN** or **J16 IAO LAN** ports
- Personal computer (PC) with *WaveStar*® CIT software installed
- Wrist strap



NOTICE

Service-disruption hazard

Failure to equip the expected circuit packs in the shelf and clear any circuit pack-related alarms before replacing the SYSCTL circuit pack can result in a loss of transmission. If this occurs, you can recover transmission by equipping the expected circuit packs and restoring the database.

Equip an expected circuit pack in every slot for which there is an expected circuit pack type.

If the network element is reporting any `CP removed`, `CP not allowed`, *or* `Unexpected CP type` *alarms, do* NOT *replace the SYSCTL circuit pack.*

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Ensure that a SYSCTL circuit pack is available for replacement.
3. Restoring the network element database may be service-affecting. If provisioning changes were made after the last backup files were created, examine the security log and use the appropriate *WaveStar*® CIT commands to manually apply the recent provisioning changes to the just-restored database.

   Important! If you wish to upgrade an LNW1 to an LNW2, you must use either Procedure 2-4: "Upgrade software generic via FTAM" (p. 2-62) or Procedure 2-5: "Upgrade software generic via FTP" (p. 2-93).

Steps

Complete the following steps to replace an LNW2 SYSCTL with an LNW2 SYSCTL.

1 Do you wish to use the upgrade/replace your LNW2 SYSCTL by replacing NVMs or by using Maintenance Mode Wizard (FTP or FTAM)?

If...	Then...
NVM replacement (recommended method)	You must have physical access to your shelf and controller. Your LNW2 may be functioning or failed. Proceed to Procedure 12-16.1: "Upgrade or replace SYSCTL (LNW2) by replacing NVMs" (p. 12-328).
FTAM	Continue with Step 2. Your LNW2 must be functioning; not failed.
FTP	Continue with Step 2. Your LNW2 must be functioning; not failed.

2 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

Start the *WaveStar*® CIT software on the PC by double-clicking on the *WaveStar*® CIT icon on your desktop and login (if necessary). Refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

Result: The *Network View* appears.

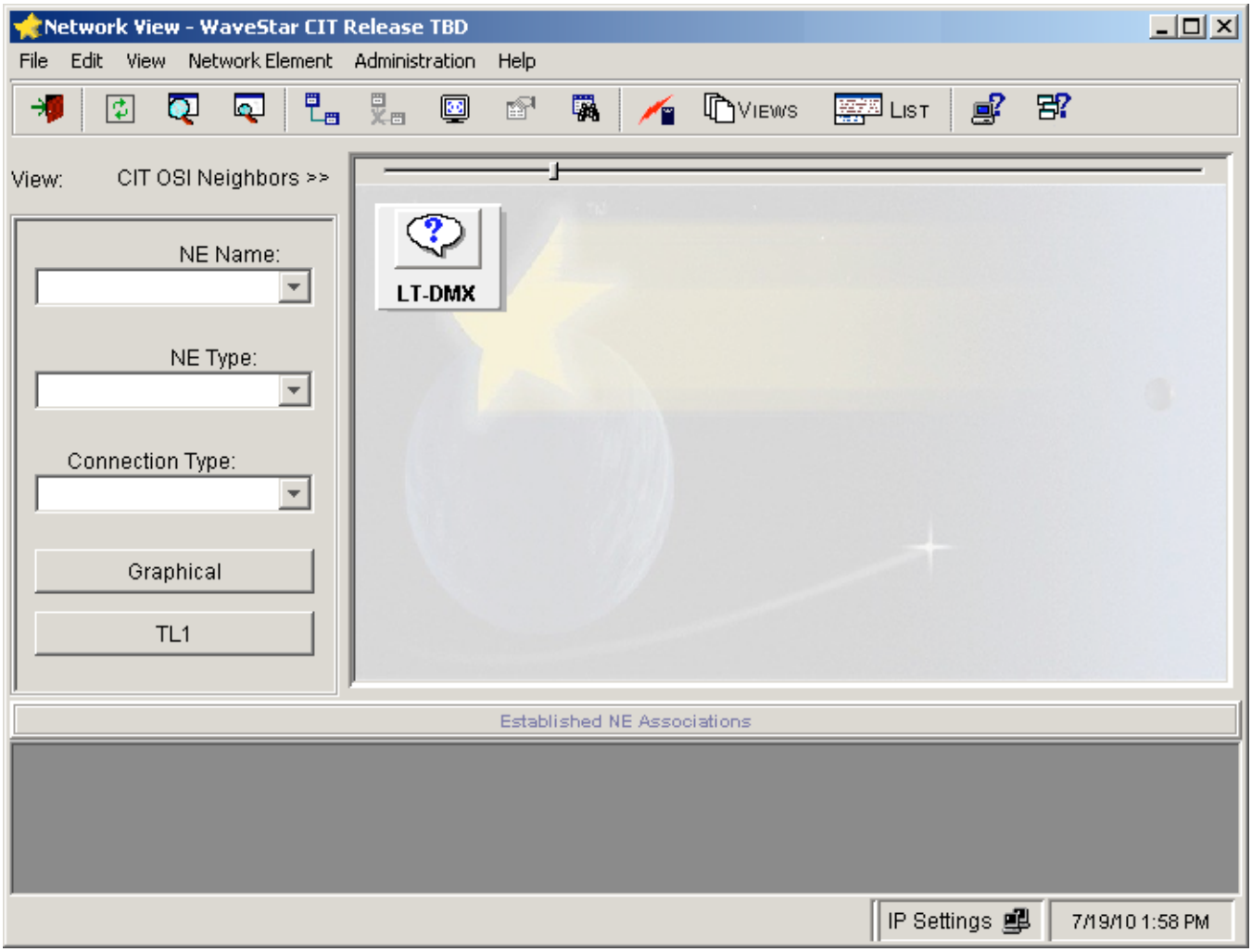
3 From the **View:** pull-down menu, select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI neighbor(s) are automatically detected.

If you were previously logged in to the NE and/or you do not see your NE, from the Network View, select **View** → **Refresh OSI View**.

Figure 12-9 CIT OSI neighbor



4 In the Network View, right-click the NE icon that was detected (default TID is LT-DMX, your TID may be different), and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

5 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

6 In the NE login window, login to the shelf using your user ID and password.

Click **OK**.

7 Would you prefer to use FTAM or FTP to continue with the SYSCTL replacement?

If...	Then...
FTAM	You must have OSI connectivity (via your OSI LAN or DCC) to your shelf. Proceed to Procedure 12-16.2: "Upgrade or replace SYSCTL (LNW2) circuit pack using FTAM" (p. 12-330).
FTP	You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address. Proceed to Procedure 12-16.3: "Upgrade or replace SYSCTL (LNW2) circuit pack using FTP" (p. 12-351).

END OF STEPS

Procedure 12-16.1: Upgrade or replace SYSCTL (LNW2) by replacing NVMs

Overview

Use this procedure to replace an LNW2 by replacing NVMs.

Important! You must have physical access to your shelf and controller.

Required equipment

Refer to "Required equipment" (p. 12-324) in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324) for a list of equipment required to perform this procedure.

Before you begin

Prior to performing this procedure, complete Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324).

Steps

Complete the following steps to replace an LNW2 by replacing NVMs.

1 Initiate a ten-second countdown (9, 8, 7, 6, 5, 4, 3, 2, 1, 0) in the **IND** display on the LNW2 SYSCTL by simultaneously depressing the **ACO TEST** and **SEL** buttons on the front of the LNW2 SYSCTL.

Important! Removing the LNW2 without initiating the ten-second countdown may result in unexpected and undesirable protection switches, incorrect circuit fault indications, or incoming signal failure alarms. All SYSCTL functions are suspended during the countdown.

2 Remove the LNW2 SYSCTL circuit pack during the 10-second countdown. This LNW2 will be referred to as the "old" SYSCTL throughout this procedure.

Important! While the SYSCTL circuit pack is removed, do *NOT* remove or replace any transmission circuit packs.

3 Physically remove the NVMs from your old LNW2 and set them aside.

4 Remove the NVMs from your new (replacement) LNW2 and set them aside.

5 Insert the NVMs that you removed from the old SYSCTL in Step 3 in the empty NVM sockets in your new (replacement) LNW2.

6 **Important!** For software installation, ensure that two NVMs are present in the LNW2 SYSCTL. You should have installed the NVMs from your old SYSCTL in your new SYSCTL.

Seat the new LNW2 SYSCTL circuit pack equipped with the NVMs from the old SYSCTL and allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 15 seconds. After approximately 15 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and then **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted.
4. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. After approximately 30 seconds, the **CR** LED flashes 10 times and then extinguishes, and the **b** continues flashing for approximately another 30 seconds, and then **IND** display is blank.
5. The **ACTIVE** LED remains lighted and the other LEDs return to their previous states; prior to the replacement.
6. Continue with Step 7.

7 Proceed to Procedure 12-16.4: “Verify proper software generic” (p. 12-374).

END OF STEPS

Procedure 12-16.2: Upgrade or replace SYSCTL (LNW2) circuit pack using FTAM

Overview

Use this procedure to replace an LNW2 using the File Transfer and Access Management (FTAM) protocol.

Important! You must have OSI connectivity (via your OSI LAN or DCC) to the network element to use FTAM.

Required equipment

Refer to "Required equipment" (p. 12-324) in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324) for a list of equipment required to perform this procedure.

Before you begin

Prior to performing this procedure, complete Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324).

Steps

Complete the following steps to replace your SYSCTL using FTAM.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **FTAM**.

3 In the **Source/Destination Directory Path** field, enter **`\backups\<filename>`**.

You may also click the **Browse** button next to the *Path:* field to browse to any directory on your PC.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup. If you selected the default installation location for the *WaveStar*® CIT and software generic: **`\generics\DMX\9.1.0\p`**. If necessary, replace 9.1.0 with your current release, for example 9.1.1. The *WaveStar*® CIT automatically populates the FTAM Responder and NSAP fields.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

`C:\Program Files\Alcatel-Lucent\WaveStar CIT\`

If you wish to store your data in a subdirectory, you may enter **`\backups\<subdirectory>\<filename>`** if the subdirectory exists before the command is sent. Directories will not be created by this command, and therefore the command will be denied if any directory in the path does not already exist.

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

4 Click **OK**.

You will be asked to verify that you wish to backup to the directory that you entered above. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears, indicating that the backup is in progress. When the backup completes, a `Remote Backup successful` screen appears. Click **OK**. The backup file is now stored. If the default path and a subdirectory were used, the file may be found at:

`C:\Program Files\Alcatel-Lucent/WaveStar CIT\backups\<subdirectory>\<filename>`

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

5 Close your *WaveStar*® CIT session with the NE. From the System View, select **File** → **NE Disconnect** and click **Yes** in the confirmation window.

Result: The *System View* closes.

6 Disconnect the LAN and/or serial cables from the **LAN** and/or **RS232** port(s) on the front of the LNW2 SYSCTL.

7 Initiate a ten-second countdown (9, 8, 7, 6, 5, 4, 3, 2, 1, 0) in the **IND** display on the LNW2 SYSCTL by simultaneously depressing the **ACO TEST** and **SEL** buttons on the front of the LNW2 SYSCTL.

Important! Removing the LNW2 without initiating the ten-second countdown may result in unexpected and undesirable protection switches, incorrect circuit fault indications, or incoming signal failure alarms. All SYSCTL functions are suspended during the countdown.

8 Remove the SYSCTL circuit pack during the 10-second countdown.

Important! While the SYSCTL circuit pack is removed, do *NOT* remove or replace any transmission circuit packs.

9 **Important!** For installation, two NVMs must be present in the LNW2 SYSCTL. If either NVM is missing, an `NVM removed` alarm will be issued. If both NVM holders are empty, after the circuit pack is installed the **IND** displays an alternating **E** and **0** and **1**. Refer to Step 10 for the complete listing of codes.

Seat the new LNW2 SYSCTL circuit pack and allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 15 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and then **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.

   Because the LNW2 SYSCTL is in Maintenance Mode, an alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9, depending on your Maintenance Mode) and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
4. Continue with Step 10.

10 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
alternating **M** and **P** and **6** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **7** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Continue with Step 11.

If...	Then...
alternating **M** and **P** and **7** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **1**	7.1 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **8** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **9** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Continue with Step 11.
alternating **M** and **P** and **9** and "**.**" ("." is a red, four-segment square [2 x 2] representing a period) and **1**	9.1 Maintenance Mode. Continue with Step 11.
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent-supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **1** and **0**	LNW2 SYSCTL will not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.
alternating **N** and **O** and **x**	"x" indicates that the NVM socket (1 or 2) is empty or the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.

If...	Then...
Letter **U**	LNW2 SYSCTL will not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

11 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

12 From the Network View of the *WaveStar*® CIT session you established in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

13 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

Your TID will be LT-DMX; when in Maintenance Mode, the TID is always default.

14 In the Network View, right-click the LT-DMX NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

15 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

16 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

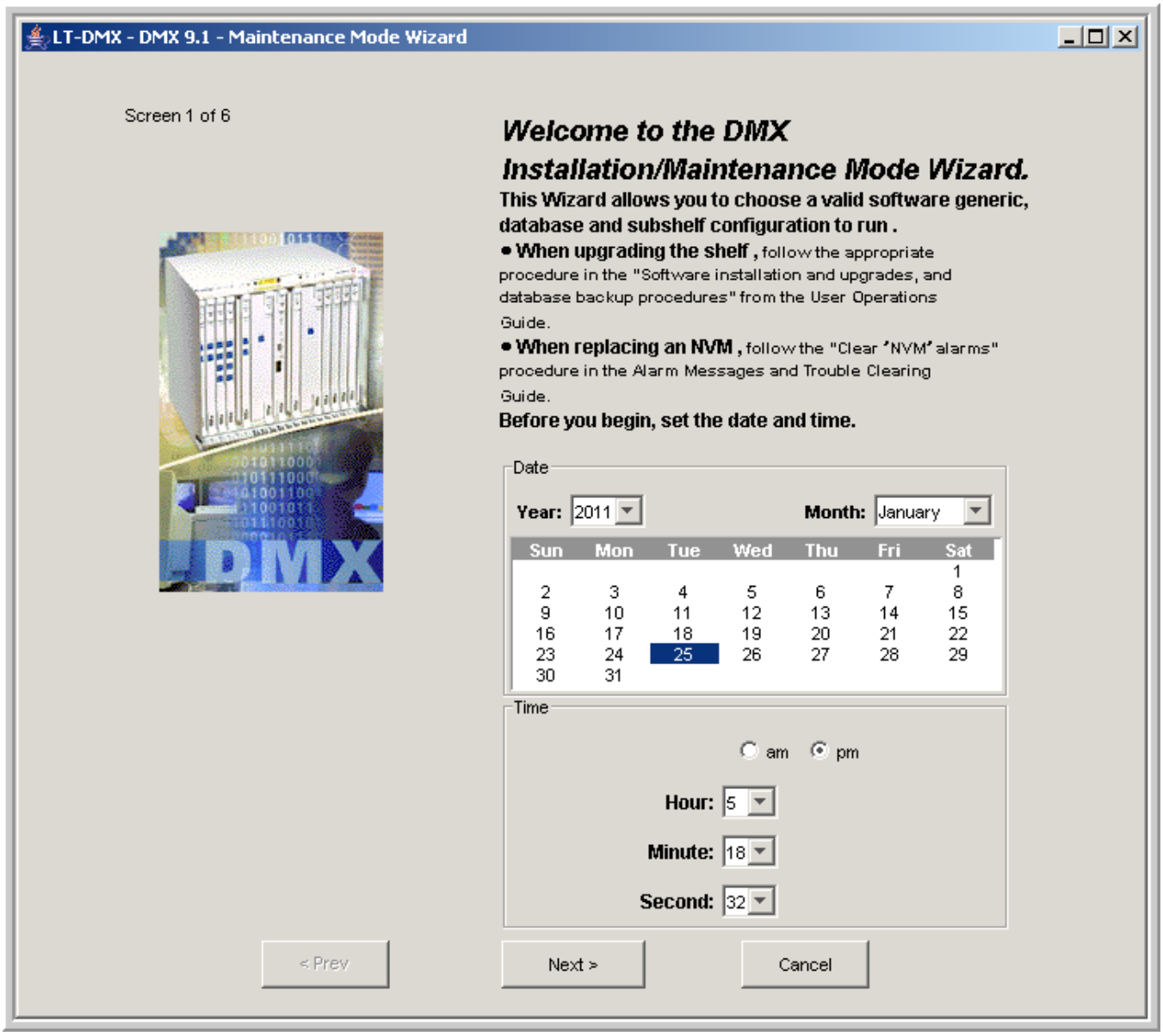
Password: ***DMX2.5G10G***

Click **OK**.

Important! After you select your backup database, complete the Maintenance Mode Wizard, and the NE restarts, your original User IDs and Passwords will be restored.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 10), the title bar of the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0, DMX 9.0, or DMX 9.1.



This screen picks up the time format preference from the *WaveStar*® CIT.

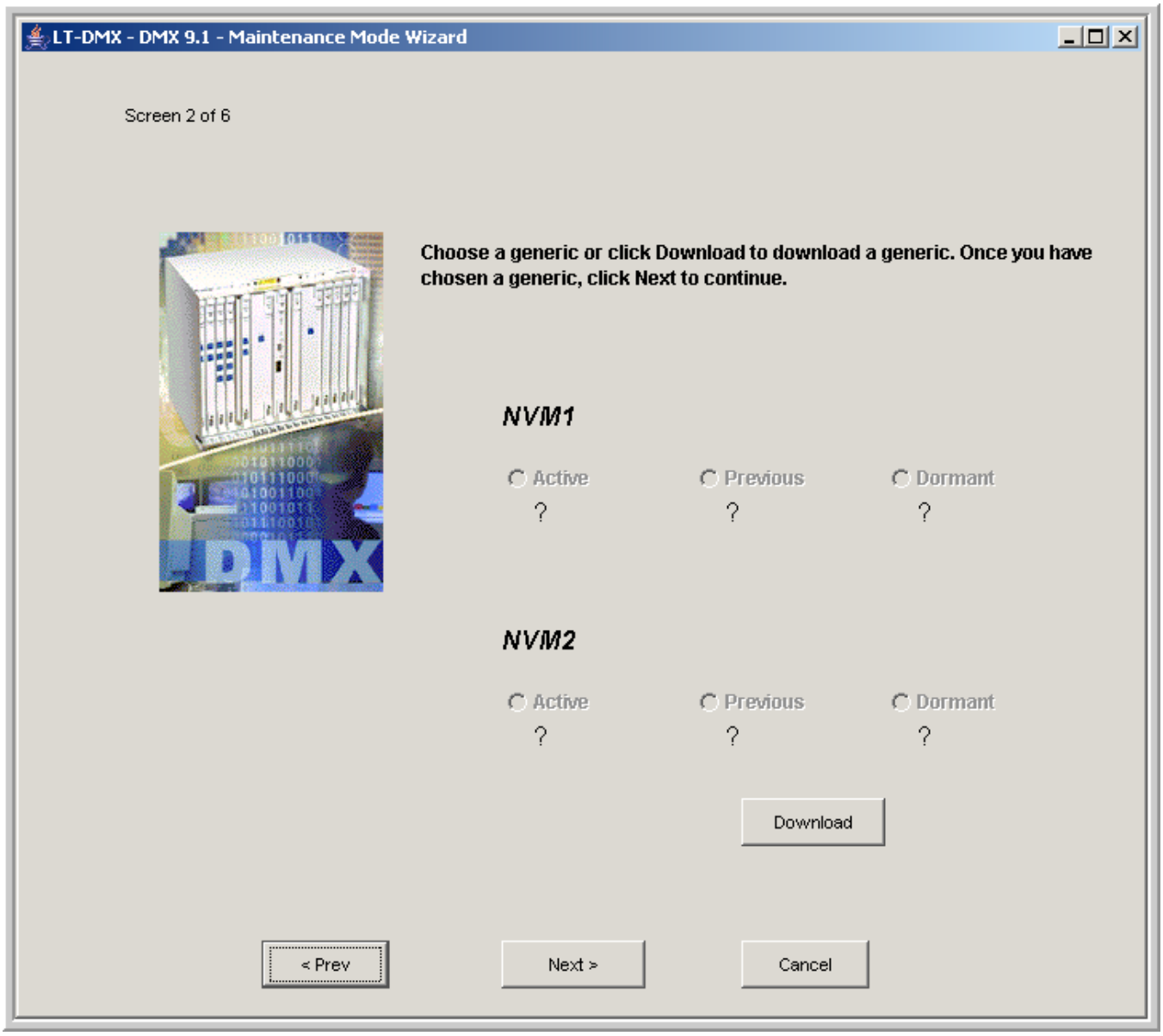
You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking on the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

17 **Important!** The actual time and date are preset from your PC.

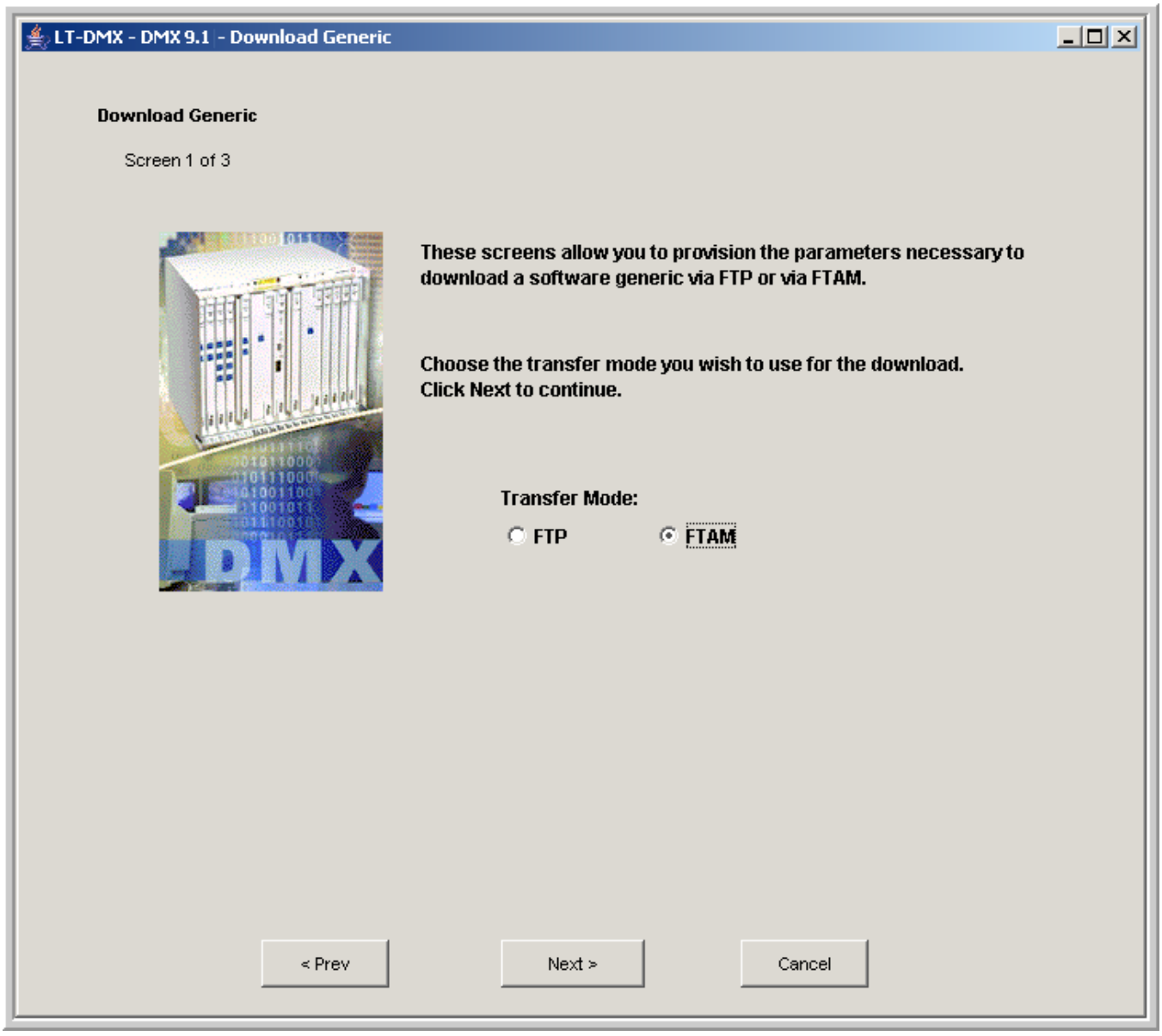
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



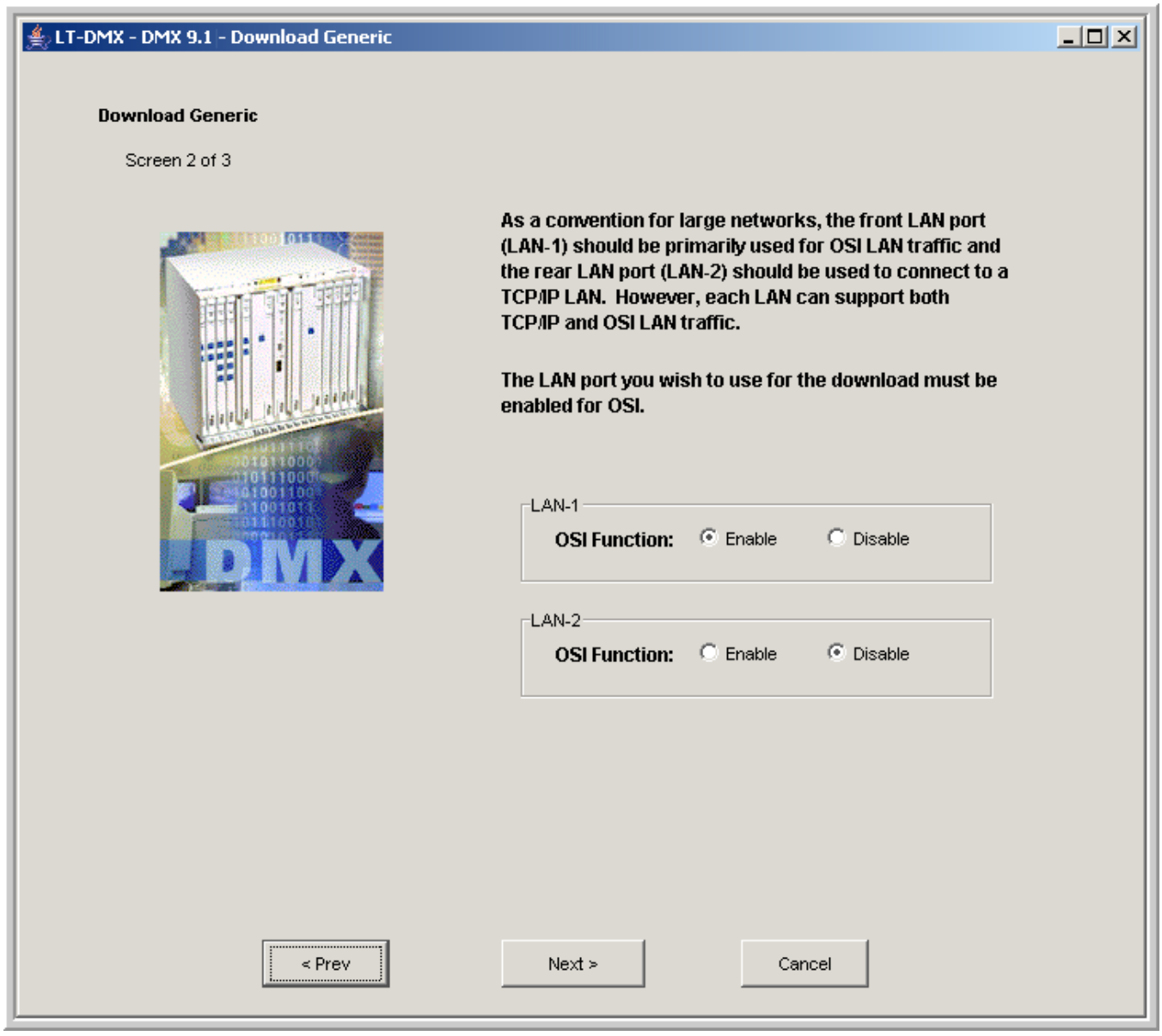
18 On Screen 2 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Generic Wizard appears.



19 On Screen 1 of 3 in the Download Generic Wizard, read the information, select **FTAM** and click **Next**.

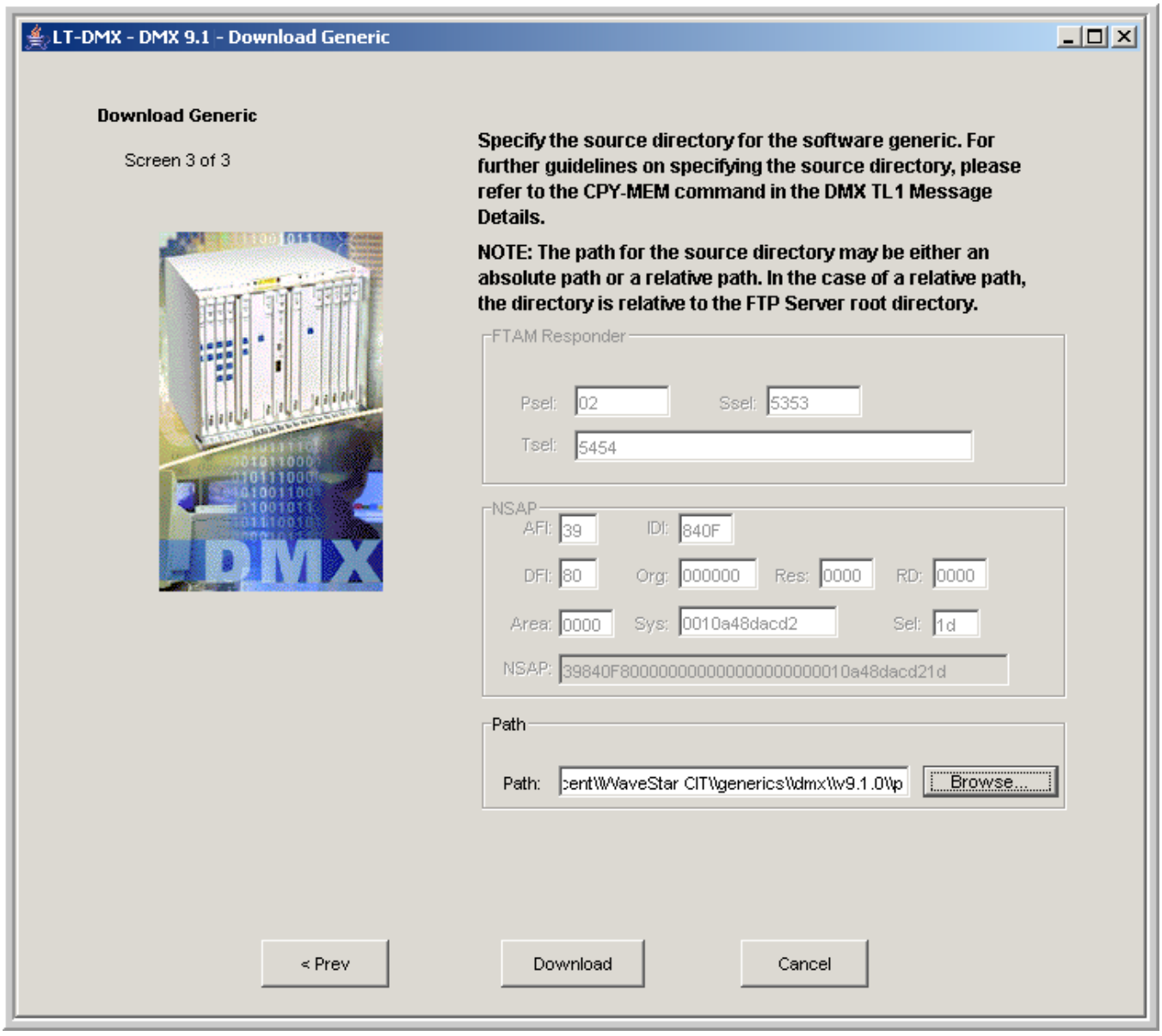
Result: Screen 2 of 3 in the Download Generic Wizard appears.



20 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

On Screen 2 of 3 in the Download Generic Wizard, read the information, verify that the LAN port you are connected to has OSI Function Enable selected and click **Next**.

Result: Screen 3 of 3 in the Download Generic Wizard appears.



21 On Screen 3 of 3 in the Download Generic Wizard in the **Path** panel, enter the current location of the generic to be downloaded in the Path field or use the **Browse** button to select the generic to be downloaded. Click **Download**.

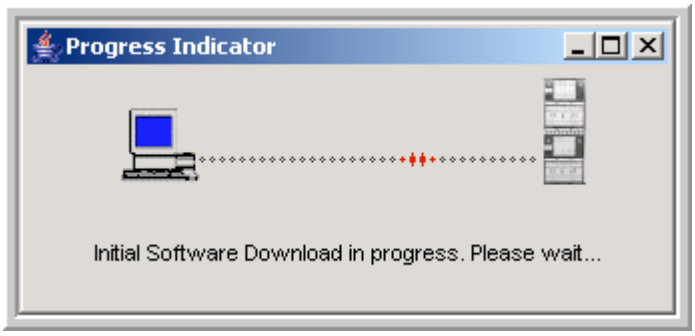
The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**. The syntax of the

relative path must start with the path name; for example: **\generics\DMX\9.1.0\p**. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

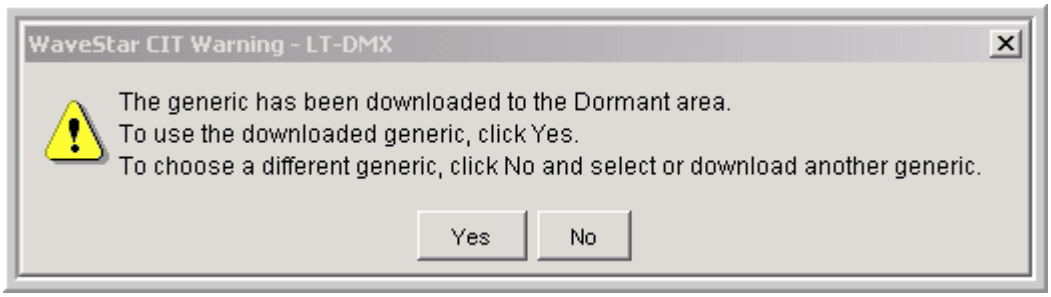
Result: A warning message appears listing the options you provisioned in the previous screens.

22 Verify the information and either click **Yes** to start the download process or click **No** to return to the download screen and change your selections.

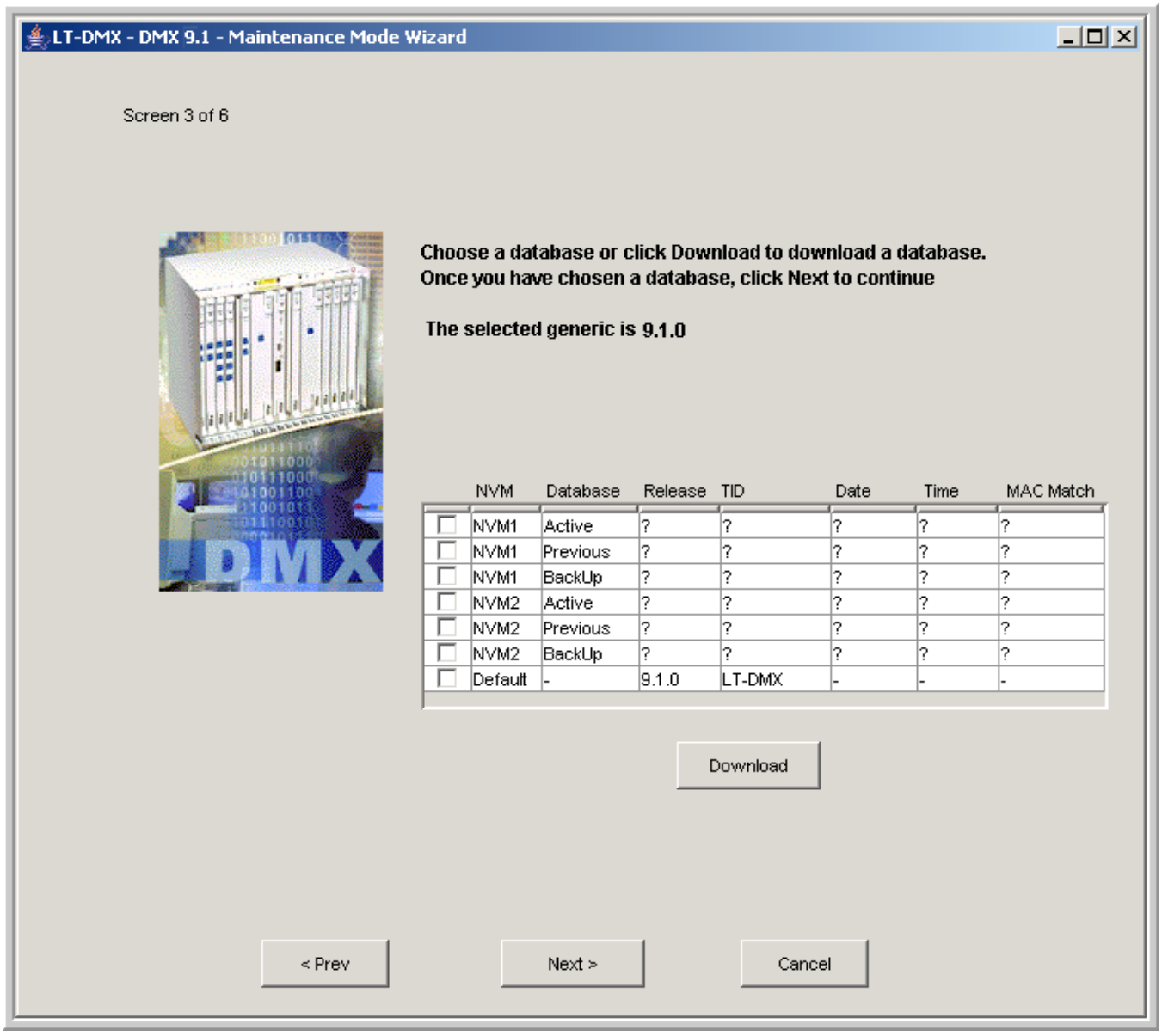
Result: If you choose yes, the following initial software download progress indicator runs for approximately 30 minutes.



23 Once the software generic download is complete, the following confirmation message appears. Click **Yes** to use the generic that is now in the Dormant area.



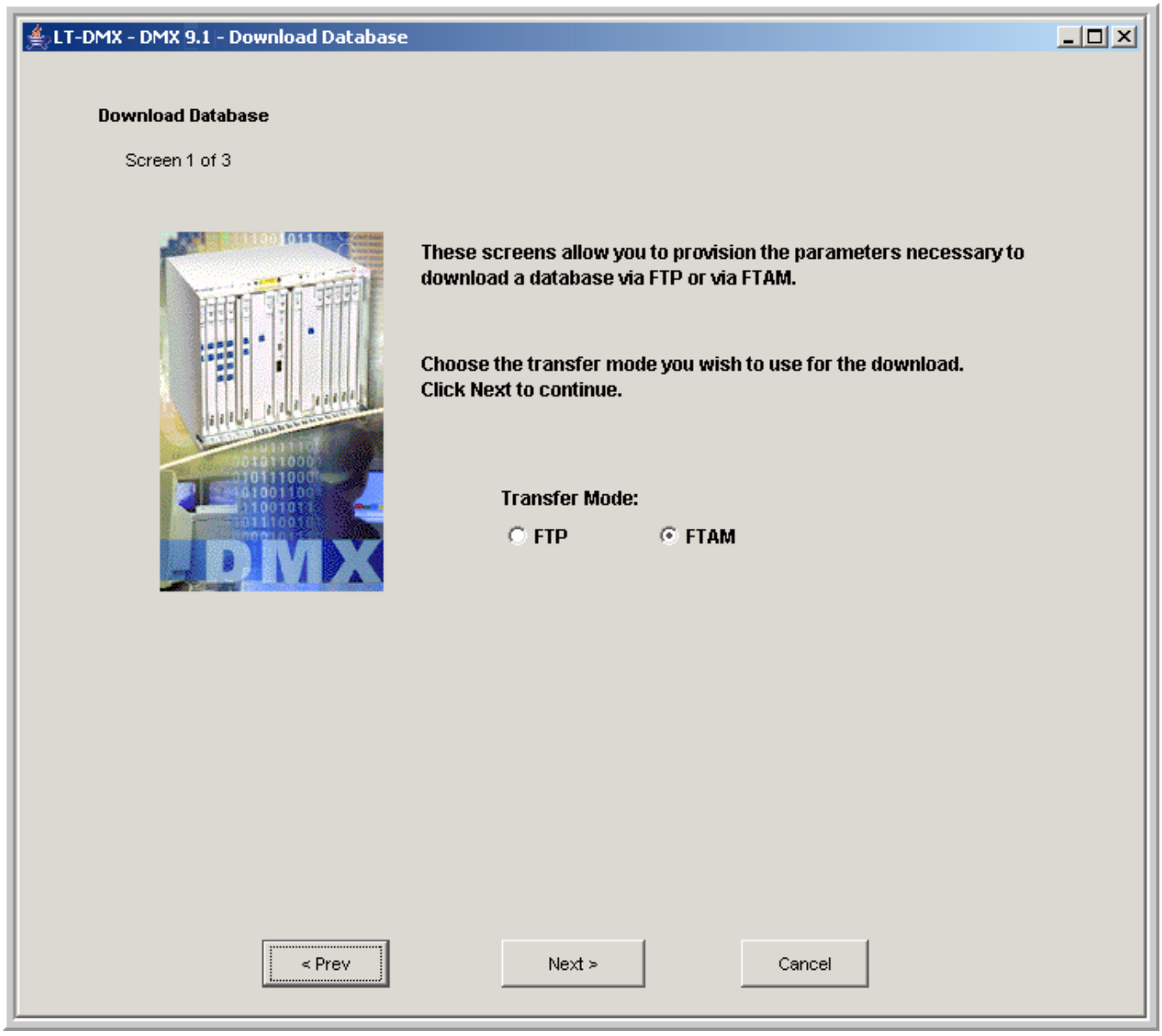
Result: Screen 3 of 6 in the Maintenance Mode Wizard appears.



24 **Important!** Do NOT select the default database or you could loose service to your shelf. You MUST download your previously backed up database.

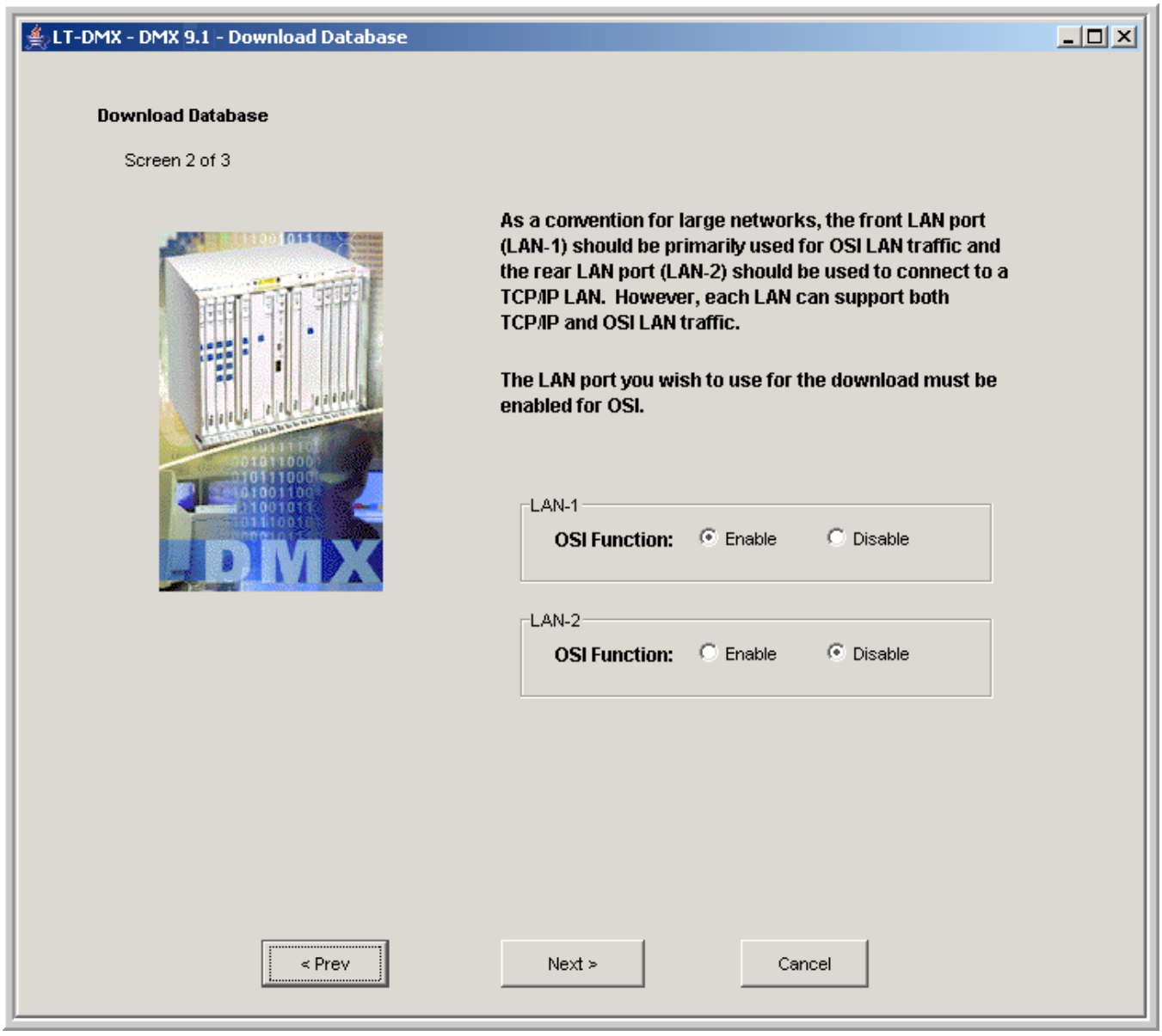
On Screen 3 of 6 in the Maintenance Mode Wizard, click **Download** to select the database you backed up from your original SYSCTL.

Result: Screen 1 of 3 in the Download Database Wizard appears.



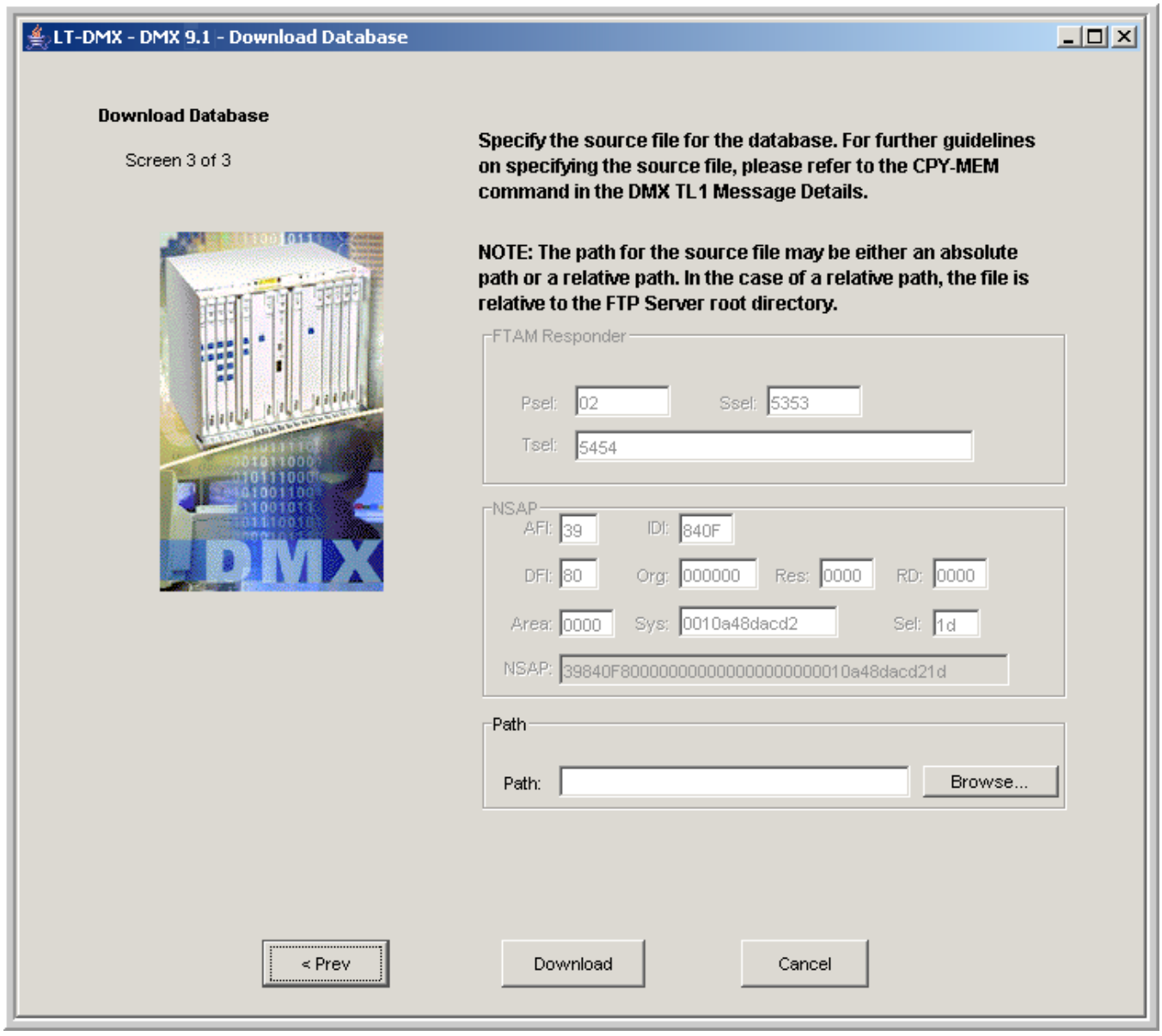
25 On Screen 1 of 3 in the Download Database Wizard, read the information, select **FTAM** and click **Next**.

Result: Screen 2 of 3 in the Download Database Wizard appears.



26 On Screen 2 of 3 in the Download Database Wizard, read the information, verify that the LAN port you are connected to has OSI Function Enable selected and click **Next**.

Result: Screen 3 of 3 in the Download Database Wizard appears.



27 On Screen 3 of 3 in the Download Database Wizard in the **Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Step 3. For example: **`\backups\<subdirectory>\<filename>`**.

You may also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and select the required file.

Click **Download**.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

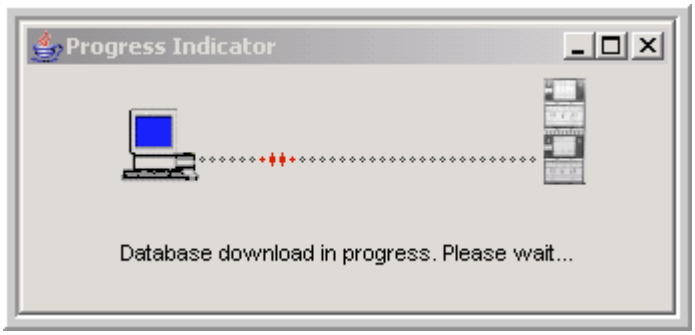
`C:/Program Files/Alcatel-Lucent/WaveStar CIT/`

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

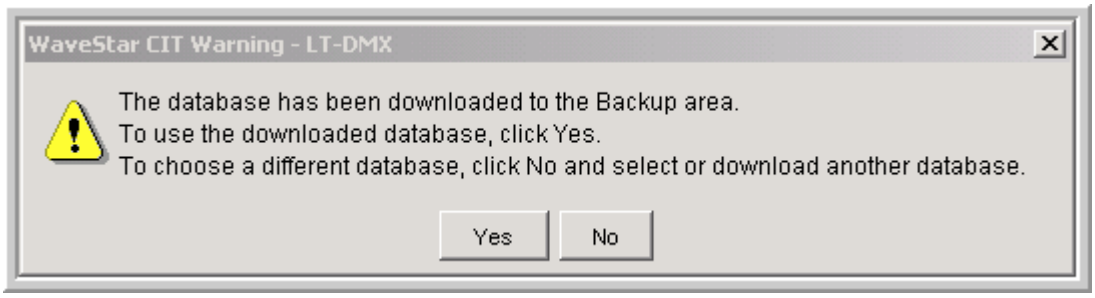
Result: A warning message appears listing the options you provisioned in the previous screens.

28 Verify the information and click **Yes**.

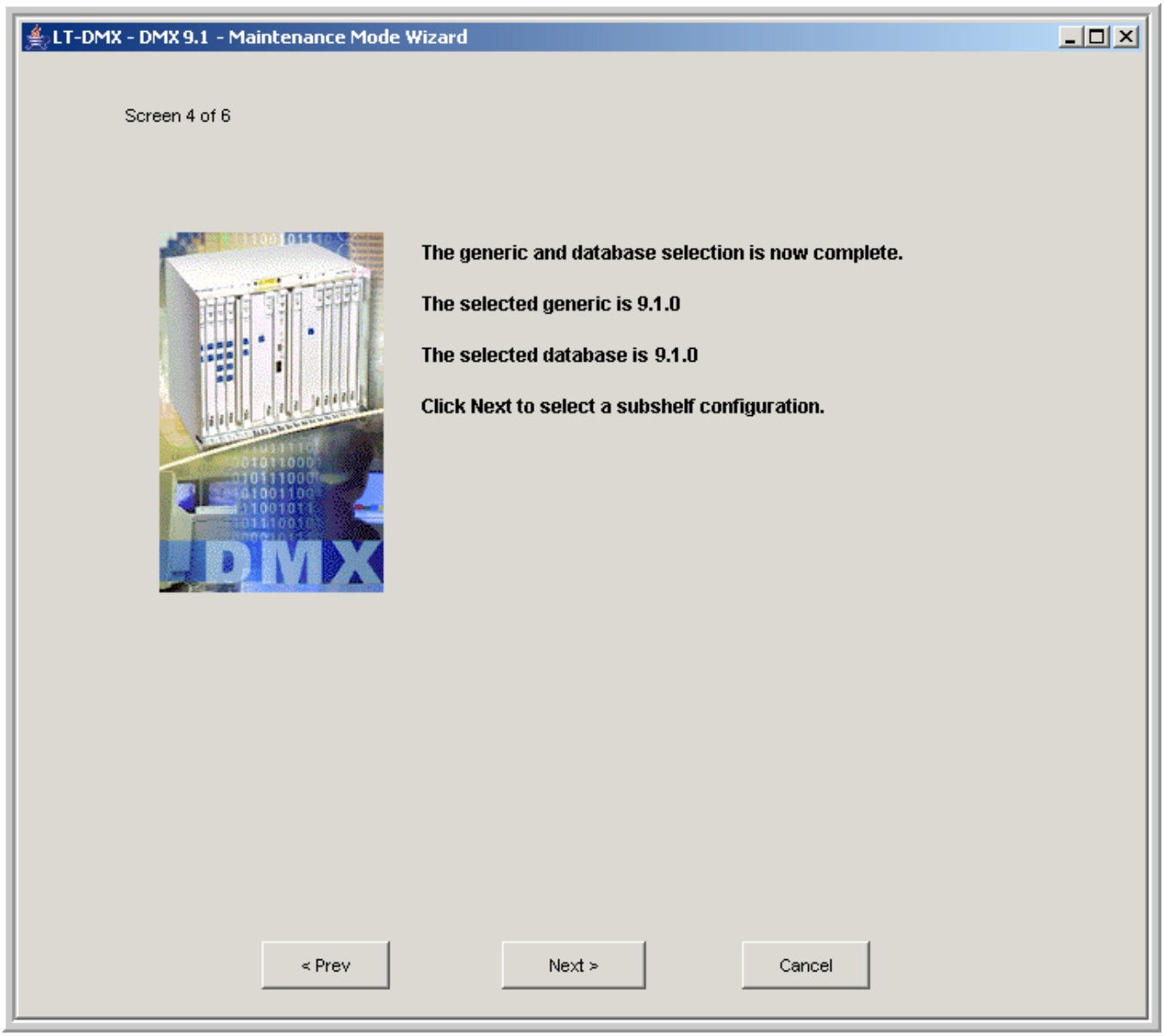
Result: If you choose Yes, the database download progress indicator runs for approximately two minutes.



29 Once the database download is complete, the following confirmation message appears. Click **Yes** to use the database that is now in the Backup area.

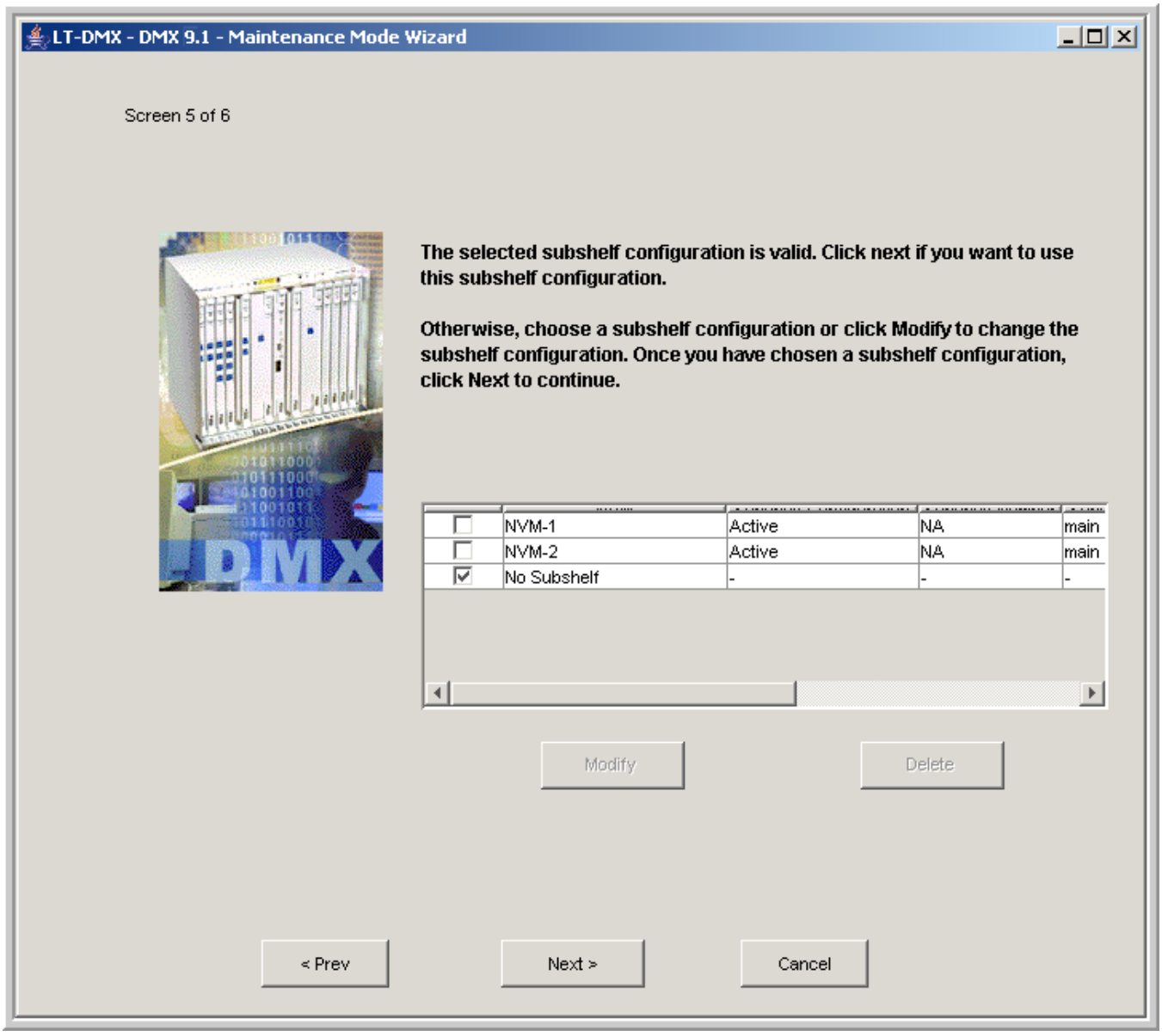


Result: Screen 4 of 6 in the Maintenance Mode Wizard appears. In this screen, 9.1.0 is an example; your selected generic could be different, for example 9.1.1.



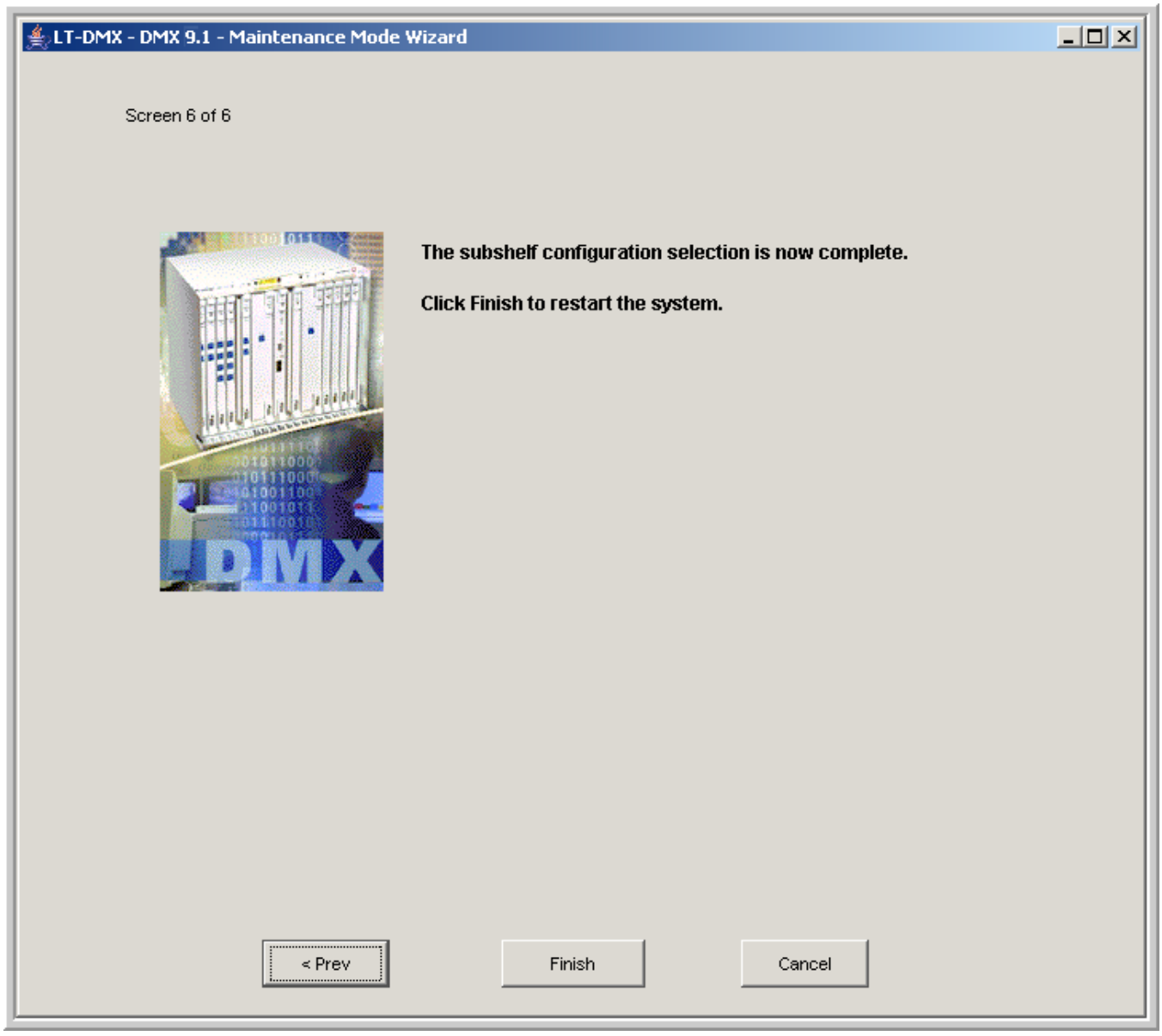
30 On Screen 4 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct 9.1.x generic and the default database, and click **Next** .

Result: Screen 5 of 6 in the Maintenance Mode Wizard appears.



31 On Screen 5 of 6 in the Maintenance Mode Wizard, select *No Subshelf* or select NVM 1 or 2 if this shelf will be a subshelf and click **Next** .

Result: Screen 6 of 6 in the Maintenance Mode Wizard appears.



32 On Screen 6 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct generic and database and click **Finish** to restart the system and apply the generic and database.

Result: The Maintenance Mode Wizard closes and your connection to the shelf is terminated.

The LNW2 SYSCTL exhibits the following visible cycles while the generic and database are installed and validated and the SYSCTL reboots:

1. For approximately 20 minutes, the alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9, depending on your Maintenance Mode) and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
2. After approximately 20 minutes, all LEDs extinguish and the **IND** display on the SYSCTL is blank for approximately 5 seconds.
3. A flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and then **IND** display is blank for approximately 20 seconds.
4. The **ACTIVE** LED lights and remains lighted.
5. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 2.5 minutes while the database is being converted and then **IND** display is blank.
6. When nothing appears in the **IND** display and the **ACTIVE** LED is lighted and the other LEDs return to their previous state (pre-backup), the NE software and database installation is complete.

   However, smart circuit packs may be upgrading their firmware. If flashing green **ACTIVE** LEDs are present on a circuit pack, firmware is currently being downloaded to that pack. Wait until all smart circuit packs finish upgrading their firmware before proceeding.

   If an alarm condition existed before the upgrade, the NE rediscovers the alarm condition and activates the appropriate LEDs on the shelf.
7. Continue with Step 33.

33 Proceed to Procedure 12-16.4: "Verify proper software generic" (p. 12-374).

END OF STEPS

Procedure 12-16.3: Upgrade or replace SYSCTL (LNW2) circuit pack using FTP

Overview

Use this procedure to replace an LNW2 using File Transfer Protocol (FTP).

Important! You must have direct TCP/IP connectivity to your NE and the NE must have a defined IP address.

Required equipment

Refer to "Required equipment" (p. 12-324) in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324) for a list of equipment required to perform this procedure.

Before you begin

Prior to performing this procedure, complete Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324).

Steps

Complete the following steps to replace your SYSCTL using FTP.

1 From the System View menu, select **Configuration** → **Software** → **Remote Backup**.

2 In the pull-down **Backup To/Via:** menu, select **FTP**.

3 Select the connection from the **Profile** pull-down menu and proceed to Step 5. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password may be different.)

4 If you entered connection information in Step 3 and wish to keep the information for future backups:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

5 In the **Source/Destination Directory Path** field, enter **\backups\<filename>** if you wish to save the backup file to the default location. (If the *WaveStar*® CIT is the FTP server, a maximum of 80 characters is suggested for this field.)

You may also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and over-write the default entry. The **Browse** button is not available (greyed out) if the FTP server is not the local *WaveStar*® CIT.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

```
C:/Program Files/Alcatel-Lucent/WaveStar CIT/
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

If you wish to store your data in a subdirectory within the default path, you may enter **\backups\<subdirectory>\<filename>** if the subdirectory exists before the command is sent. Directories will not be created by this command, and therefore the command will be denied if any directory in the path does not already exist.

6 Click **OK**.

You will be asked to verify that you wish to backup to the directory that you entered above. Click **Yes** if you typed the path correctly.

Result: The *Progress Indicator* screen appears to indicate that the backup is in progress. When the backup completes, a *WaveStar*® CIT information screen appears that indicates `Remote Backup successful`. Click the **OK** button.

The backup file is now stored. If the default path and a subdirectory were used, the file may be found at:

`C:/Program Files/Alcatel-Lucent/WaveStar CIT/backups/<subdirectory>/<filename>`

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

7 Close your *WaveStar*® CIT session with the NE. From the System View, select **File** → **NE Disconnect** and click **Yes** in the confirmation window.

Result: The *System View* closes.

8 Disconnect the LAN and/or serial cables from the **LAN** and/or **RS232** port(s) on the front of the LNW2 SYSCTL.

9 Initiate a ten-second countdown (9, 8, 7, 6, 5, 4, 3, 2, 1, 0) in the **IND** display on the LNW2 SYSCTL by simultaneously depressing the **ACO TEST** and **SEL** buttons on the front of the LNW2 SYSCTL.

Important! Removing the LNW2 without initiating the ten-second countdown may result in unexpected and undesirable protection switches, incorrect circuit fault indications, or incoming signal failure alarms. All SYSCTL functions are suspended during the countdown.

10 Remove the SYSCTL circuit pack during the 10-second countdown.

Important! While the SYSCTL circuit pack is removed, do *NOT* remove or replace any transmission circuit packs.

11

Important! For installation, two NVMs must be present in the LNW2 SYSCTL. If either NVM is missing, an `NVM removed` alarm will be issued. If both NVM holders are empty, after the circuit pack is installed the **IND** displays an alternating **E** and **0** and **1**. Refer to Step 12 for the complete listing of codes.

Seat the new LNW2 SYSCTL circuit pack and allow a few minutes for the pack to complete initialization.

Result: The LNW2 SYSCTL exhibits the following visible cycles during initialization:

1. The **FAULT** LED lights and remains lighted for approximately 90 seconds. After approximately 15 seconds, a flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 75 seconds and then **IND** display is blank.
2. The **FAULT** LED remains lighted for approximately another 20 seconds and then extinguishes.
3. The **ACTIVE** LED lights and remains lighted and the **CR** LED flashes 10 times. While the **CR** LED is flashing, the **MJ**, **ABN**, and **NE** LEDs light and remain lighted.

   Because the LNW2 SYSCTL is in Maintenance Mode, an alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9, depending on your Maintenance Mode) and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
4. Continue with Step 12.

12 Observe the **IND** display on the LNW2 SYSCTL; the display indicates the state of the SYSCTL.

If...	Then...
alternating **M** and **P** and **6** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	6.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **7** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	7.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **7** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **1**	7.1 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **8** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	8.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **9** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **0**	9.0 Maintenance Mode. Continue with Step 13.
alternating **M** and **P** and **9** and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **1**	9.1 Maintenance Mode. Continue with Step 13.

If...	Then...
alternating **E** and **0** and **0**	LNW2 SYSCTL must be replaced. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **1**	No NVMs are detected on the LNW2 SYSCTL. Install two Alcatel-Lucent-supplied NVMs in the LNW2 or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **0** and **2**	NVMs are present but not readable. Check to make sure they are properly seated and repeat this procedure.
alternating **E** and **0** and **3**	Not Supported. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
alternating **E** and **1** and **0**	LNW2 SYSCTL will not boot. No compatible generic on the NVMs in the LNW2 SYSCTL. Find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure or contact your next level of support.
Letter **F**	LNW2 SYSCTL faceplate latches are not fully seated. Unseat the LNW2 SYSCTL and repeat this procedure, properly seating the faceplate latch.
alternating **N** and **O** and **x**	“x” indicates that the NVM socket (1 or 2) is empty or the NVM installed is failed. Replace the indicated NVM or find another LNW2 SYSCTL equipped with two factory-installed NVMs and repeat this procedure.
Letter **U**	LNW2 SYSCTL will not boot due to unexpected or unreadable shelf type. Repair the problem generally caused by bent pins and repeat this procedure.
flashing **b**	Boot in progress.
A red, four-segment square (2 x 2) appears in the **IND** display on the LNW2 SYSCTL.	Acknowledges the **UPD/INIT** button was momentarily pushed. Pushing the **UPD/INIT** button while in Maintenance Mode has no effect.

13 Connect the cross-over LAN cable from the Network Interface Card (NIC) on the PC to the front **LAN** port on the SYSCTL circuit pack faceplate and establish a *WaveStar*® CIT session. (When TCP/IP is enabled on the rear LAN port **J16 IAO LAN**, OSI is disabled.)

14 From the Network View of the *WaveStar*® CIT session you established in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

Result: The CIT OSI Neighbor(s) are automatically detected.

If you were previously logged in to the NE and/or you do not see your NE, from the Network View, select **View** → **Refresh OSI View**.

15 In the Network View, right-click the LT-DMXtend NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

16 In the *System Type Selection* window, select LT-DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

17 **Important!** Because the shelf is in Maintenance Mode, your logins and passwords are default.

Enter the following in the *NE Login Dialog* window (login information is case sensitive) to log in to the NE:

User ID: ***LUC01***

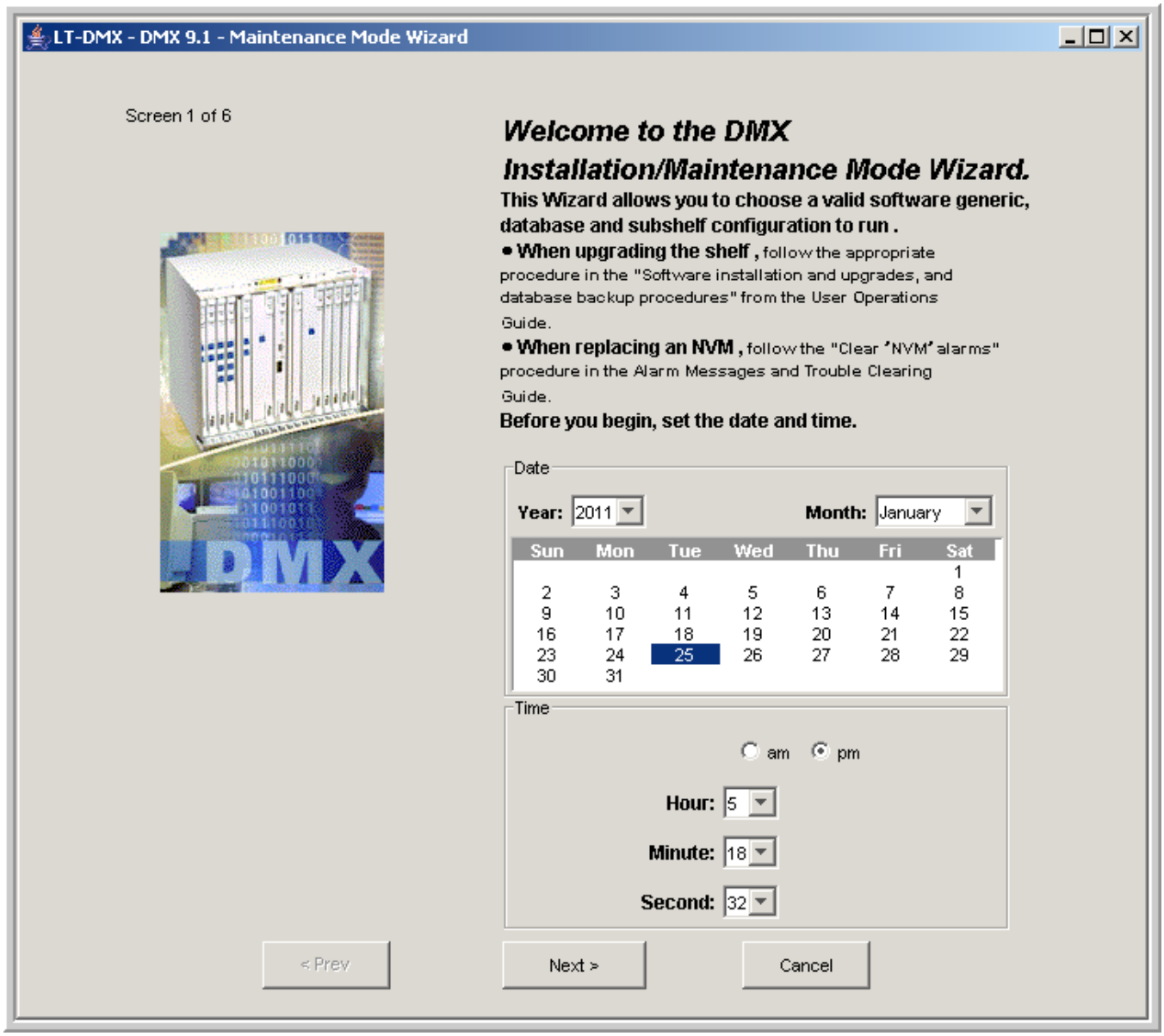
Password: ***DMX2.5G10G***

Click **OK**.

Important! After you select your backup database, complete the Maintenance Mode Wizard, and the NE restarts, your original User IDs and Passwords will be restored.

Result: Screen 1 of 6 in the Maintenance Mode Wizard appears.

Depending on the boot code of your SYSCTL (refer to Step 12), the title bar o f the Maintenance Mode Wizard displays either DMX 6.0, DMX 7.0, DMX 7.1, DMX 8.0, DMX 9.0, or DMX 9.1.



This screen picks up the time format preference from the *WaveStar*® CIT.

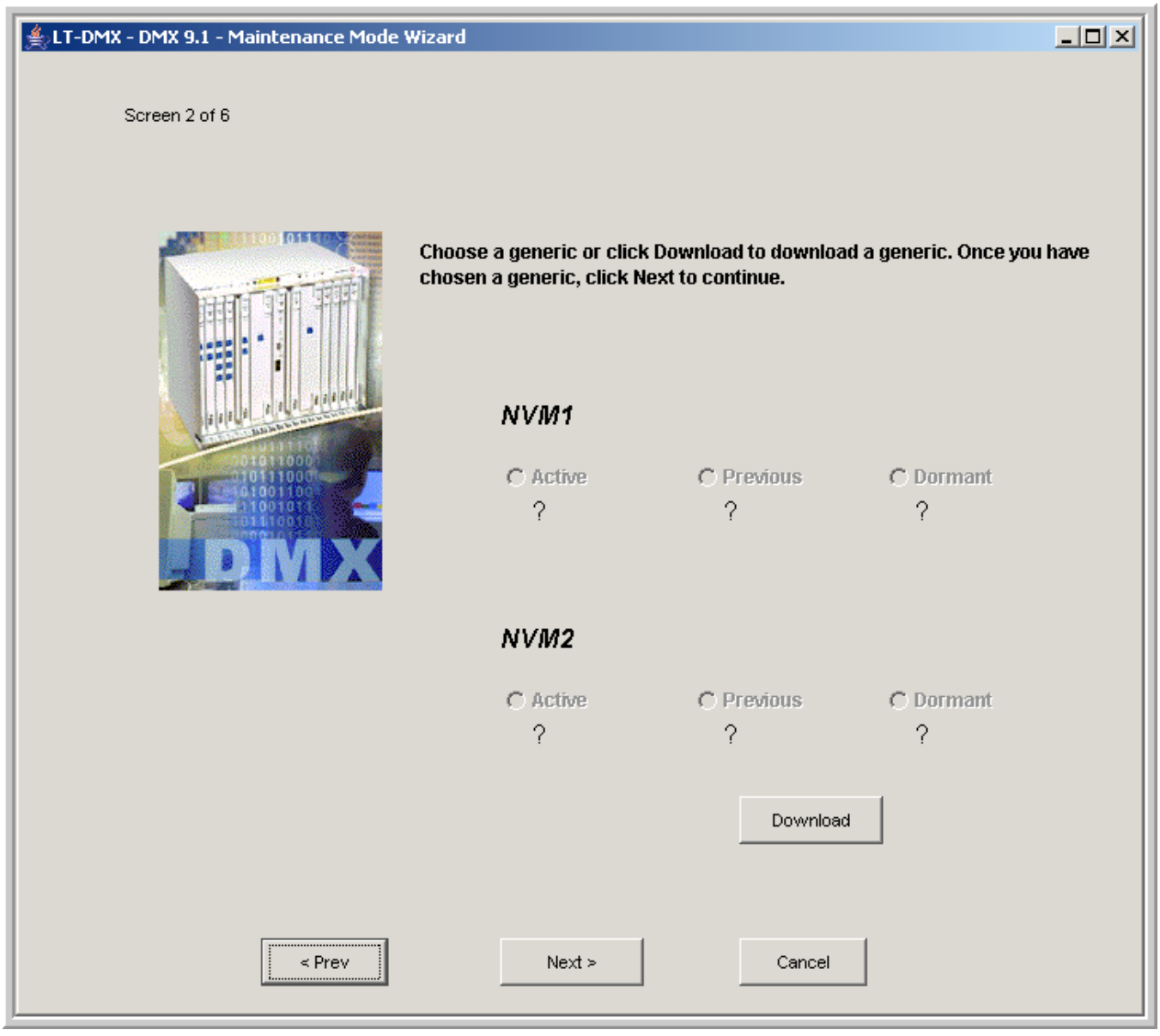
You can provision the time format display for your *WaveStar*® CIT from the Network View by selecting **View** → **Preferences** and clicking on the Display tab. This screen allows you to choose your preference for time format, either a 12-hour clock or a 24-hour clock.

- If your time format preference is a 12-hour clock, from the **Time** panel, select **Hour:** (0–12), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus. You must also specify am or pm by selecting one of the radio buttons.
- If your time format preference is a 24-hour clock, From the **Time** panel, select the **Hour:** (0–23), **Minute:** (0–59), and **Second:** (0–59) from the pull-down menus.

18 **Important!** The actual time and date are preset from your PC.

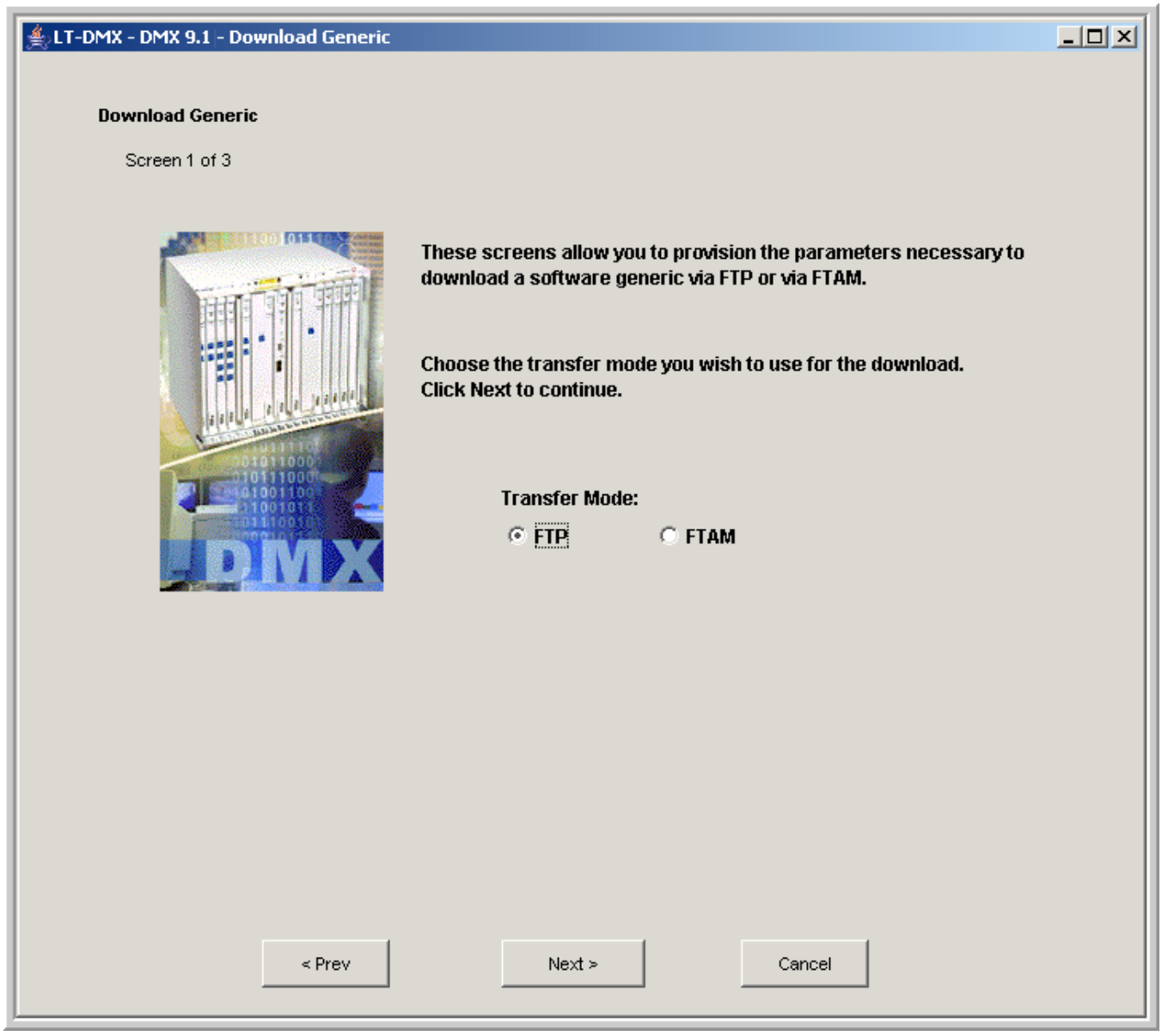
On Screen 1 of 6 in the Maintenance Mode Wizard, read the information, verify the date and time, make any required changes, and click **Next**.

Result: Screen 2 of 6 in the Maintenance Mode Wizard appears.



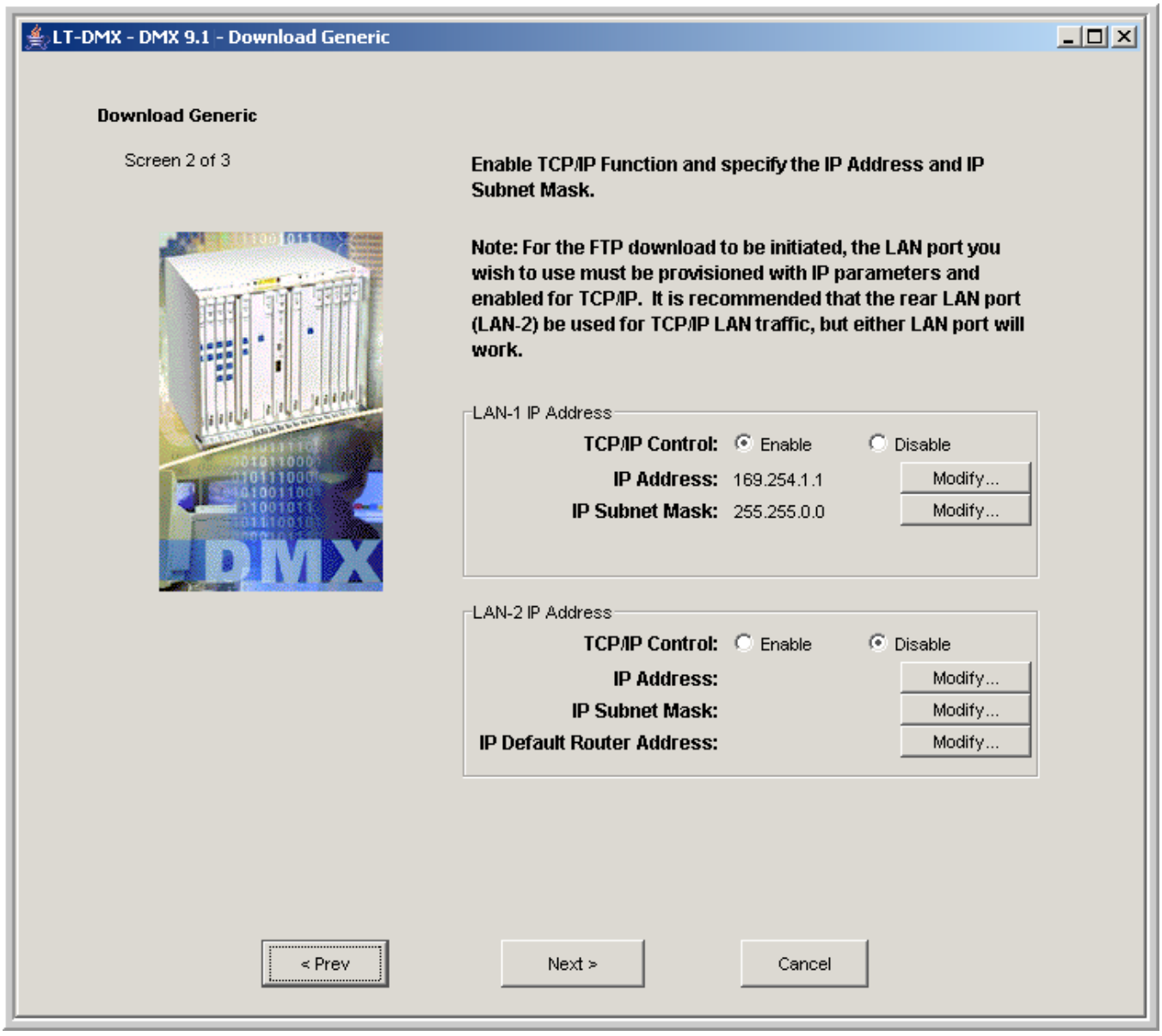
19 On Screen 2 of 6 in the Maintenance Mode Wizard, click **Download**.

Result: Screen 1 of 3 in the Download Generic Wizard appears.



20 On Screen 1 of 3 in the Download Generic Wizard, read the information, select **FTP** and click **Next**.

Result: Screen 2 of 3 in the Download Generic Wizard appears.



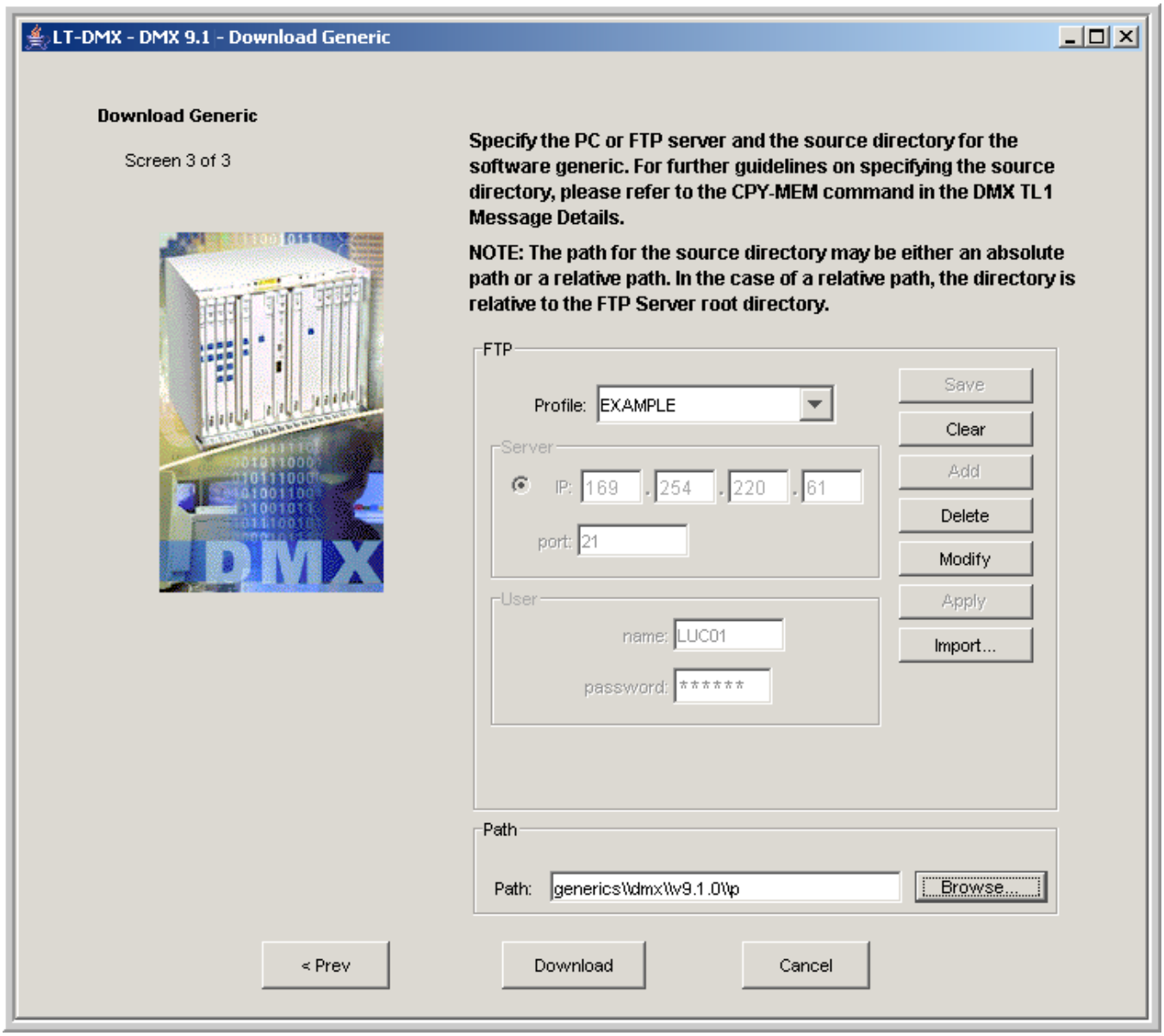
21 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

If the boot code of your LNW2 (Step 12) was 7.1 or later, you may see the IP Address and IP Subnet Mask field populated with the defaults illustrated in Screen 2 of 3.

Important! If the default IP address and subnet mask are present, you must complete the initial software installation before you can change these values.

If required, follow the instructions to enable TCP/IP Control on the LAN port to which you are connected. Click **Modify** to enter the IP Address, IP Subnet Mask, and/or IP Default Router Address. If you are connecting directly to the shelf without a router, the IP address of the FTP server must be in the same subnet as the LAN port. Click **Next**.

Result: Screen 3 of 3 in the Download Generic Wizard appears.



22 Select the connection from the **Profile** pull-down menu and proceed to Step 24. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password may be different.)

23 If you entered connection information in Step 22 and wish to keep the information for future FTP activities:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

   Important! Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

24 On Screen 3 of 3 in the Download Generic Wizard in the **Path** panel, enter the current location of the generic to be downloaded in the Path field or use the **Browse** button to select the generic to be downloaded. (If the FTP server is not the local host, the **Browse** button is greyed out.) Click **Download**.

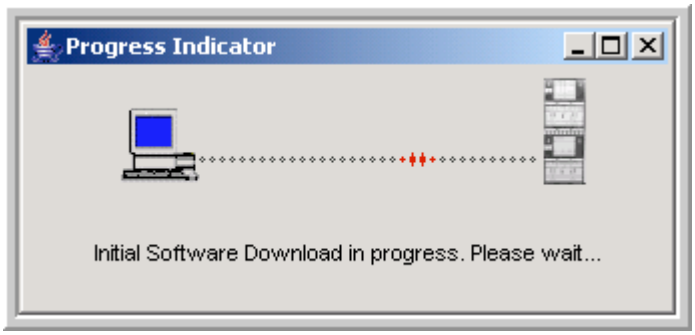
The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**. The syntax of the relative path must start with the path name; for example: **`\generics\DMX\9.1.0\p`**. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\. If necessary, replace 9.1.0 with your current release, for example 9.1.1.

If the FTP server is not the *WaveStar*® CIT, then enter the path starting at the FTP home directory on the server.

Result: A warning message appears listing the options you provisioned in the previous screens.

25 Verify the information and either click **Yes** to start the download process or click **No** to return to the download screen and change your selections.

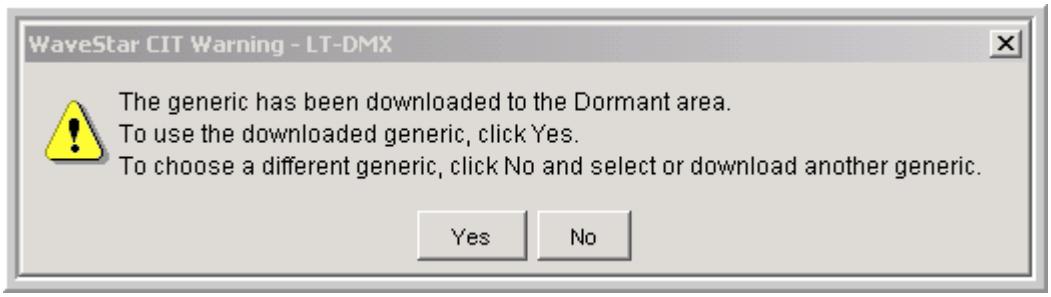
Result: If you choose yes, the following initial software download progress indicator runs for approximately 30 minutes.



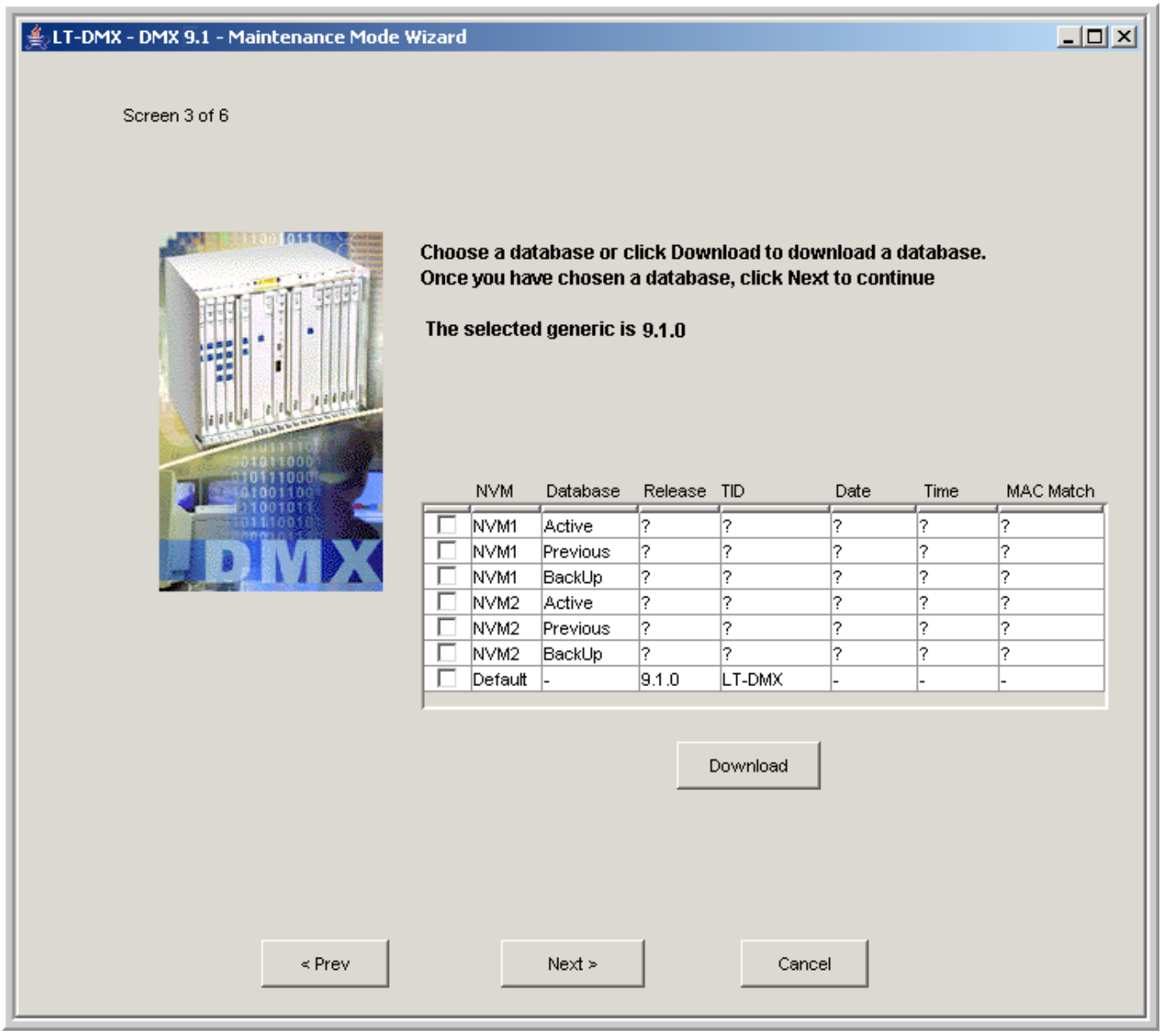
26 Do you wish to observe the FTP download progress?

If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 27.
No	Continue with Step 27.

27 Once the software generic download is complete, the following confirmation message appears. Click **Yes** to use the generic that is now in the Dormant area.



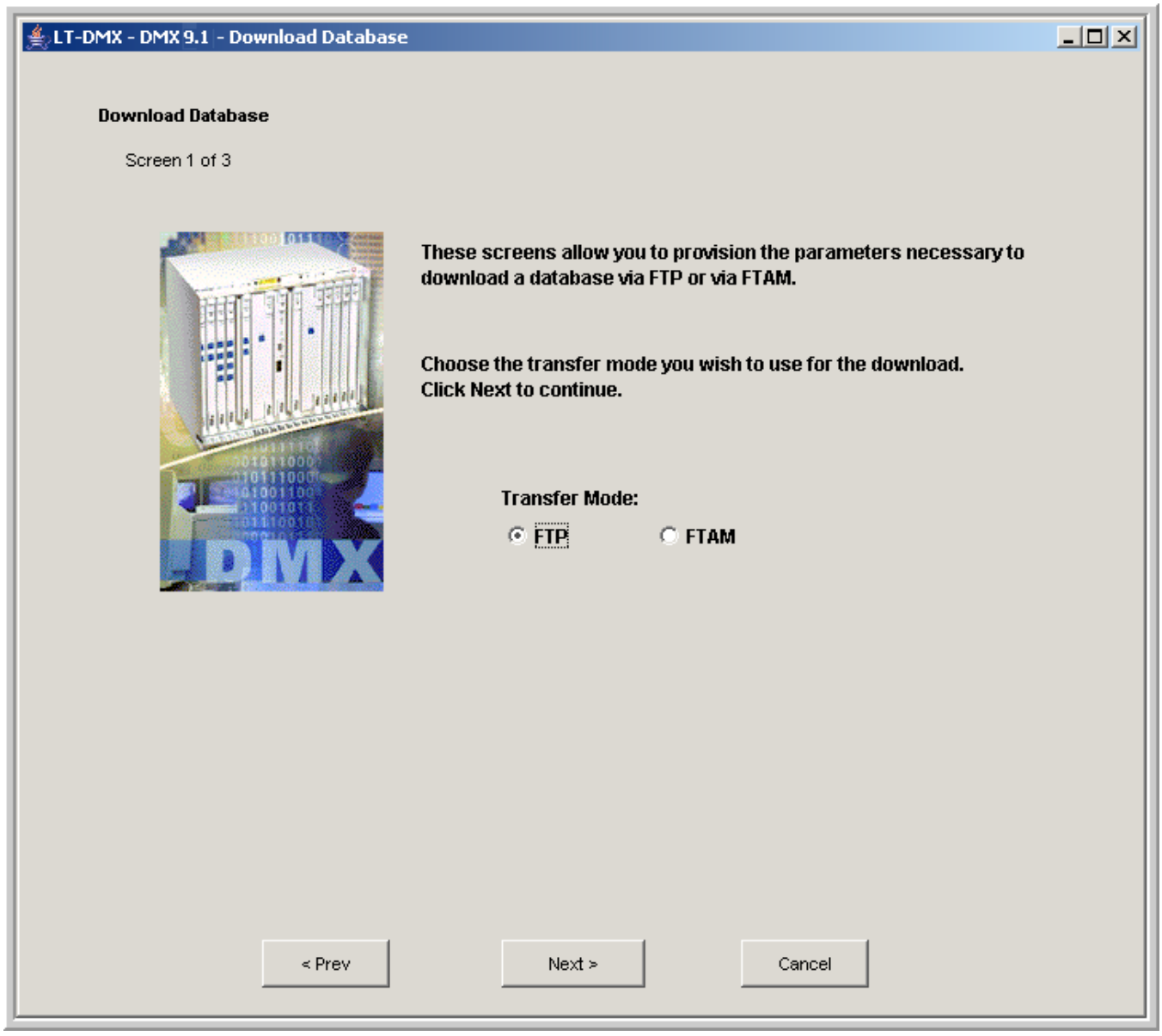
Result: Screen 3 of 6 in the Maintenance Mode Wizard appears.



28 **Important!** Do NOT select the default database or you could loose service to your shelf. You MUST download your previously backed up database.

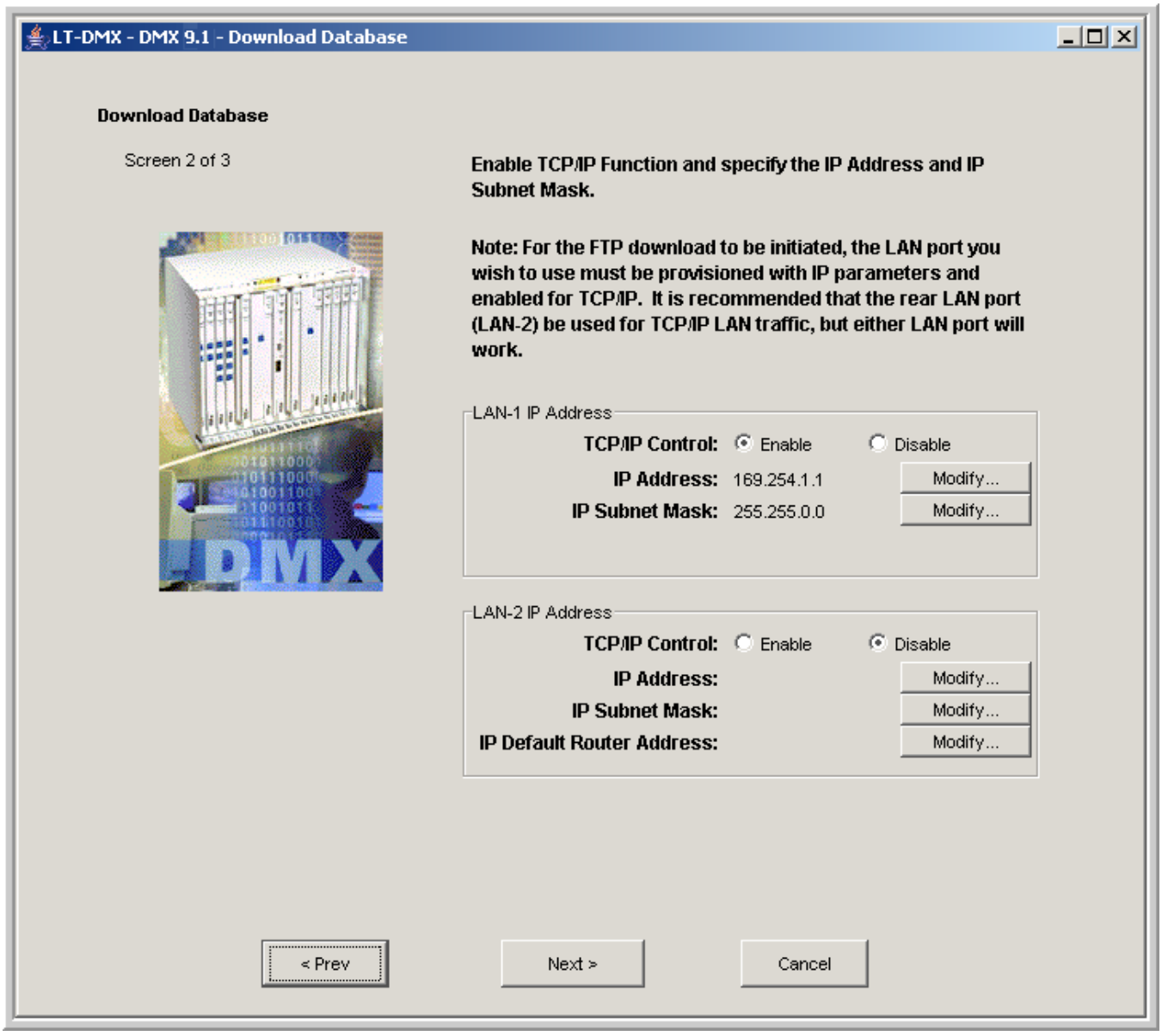
On Screen 3 of 6 in the Maintenance Mode Wizard, click **Download** to select the database you backed up from your original SYSCTL.

Result: Screen 1 of 3 in the Download Database Wizard appears.



29 On Screen 1 of 3 in the Download Database Wizard, read the information, select **FTP** and click **Next**.

Result: Screen 2 of 3 in the Download Database Wizard appears.



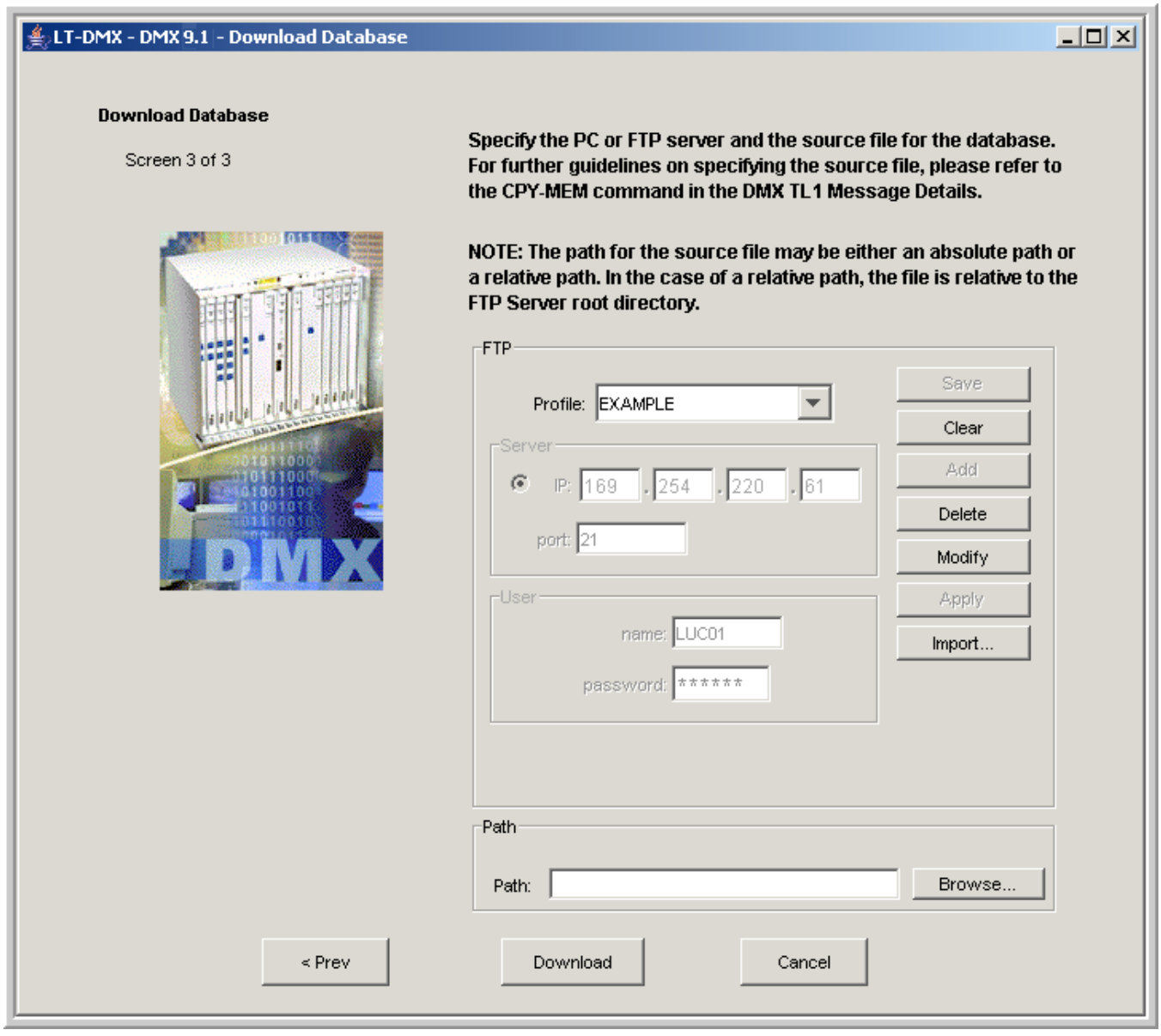
30 **Important!** LAN-1 is the **LAN** port on the faceplate of the LNW2 SYSCTL circuit pack. LAN-2 is the **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf.

On Screen 2 of 3 in the Download Database Wizard, the information entered in Step 21 should still be present and valid. If the information is not present, follow the instructions to enable TCP/IP Control on the LAN port to which you are connected. Click **Modify** to

enter the IP Address, IP Subnet Mask, and/or IP Default Router Address. If you are connecting directly to the shelf without a router, the IP address of the FTP server must be in the same subnet as the LAN port.

Click **Next**.

Result: Screen 3 of 3 in the Download Database Wizard appears.



31 Select the connection from the **Profile** pull-down menu and proceed to Step 33. *OR* Enter information for a new profile as follows:

1. In the **Server** panel, select **IP** and enter the address of the FTP server. (If the *WaveStar*® CIT is the FTP server, you can determine its IP address by entering **`ipconfig`** from the **MS DOS** prompt on your PC.)
2. If necessary, enter the port (default is blank). Defining the port is not required for the backup to execute successfully. However, a value of 21 is valid if entered.
3. In the **User** panel, enter the user name and password for the FTP server. (If you are using the *WaveStar*® CIT as your FTP server, the default user name/password for the *WaveStar*® CIT is **`LUC01`**/**`LUC+01`**, however your user ID/password may be different.)

32 If you entered connection information in Step 31 and wish to keep the information for future FTP activities:

1. Type a new name in the **Profile** menu.
2. Click **Add** to add the profile to the list.
3. Click **Save** to save the list.

Important! Entries to the **Profile** pull-down menu may be changed using the **Modify**, **Apply**, and **Save** buttons or removed using the **Delete** button.

33 On Screen 3 of 3 in the Download Database Wizard in the **Path** panel, enter the location where the database information is stored. Enter the path and filename exactly as it was entered in Step 5. For example: **`\backups\<subdirectory>\<filename>`**.

You may also click the **Browse** button next to the *Path:* field to browse to any directory on your PC and select the required file.

Click **Download**.

Important! The value of the Path field can be either an absolute path or a relative path that is relative to the FTP server root directory. The absolute path must start with the drive name followed by a colon (:) then the path names; for example: C:\temp\today\backup. The syntax of the relative path must start with the path name; for example: \temp\backup.

The *WaveStar*® CIT directory automatically enters the relative path for the *WaveStar*® CIT. The default relative path is

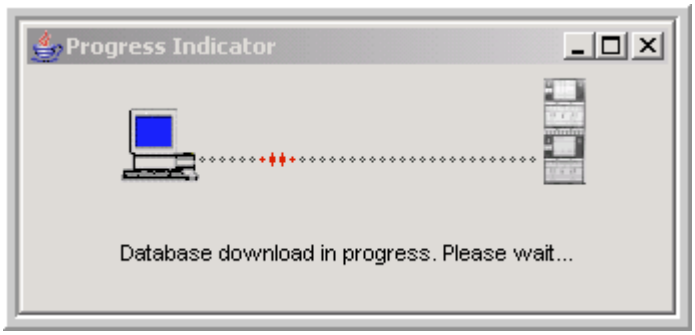
```
C:/Program Files/Alcatel-Lucent/WaveStar CIT/
```

If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.

Result: A warning message appears listing the options you provisioned in the previous screens.

34 Verify the information and click **Yes**.

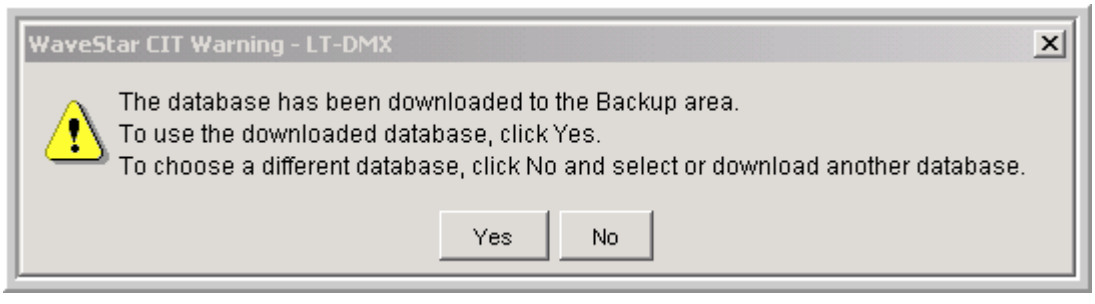
Result: If you choose Yes, the database download progress indicator runs for approximately two minutes.



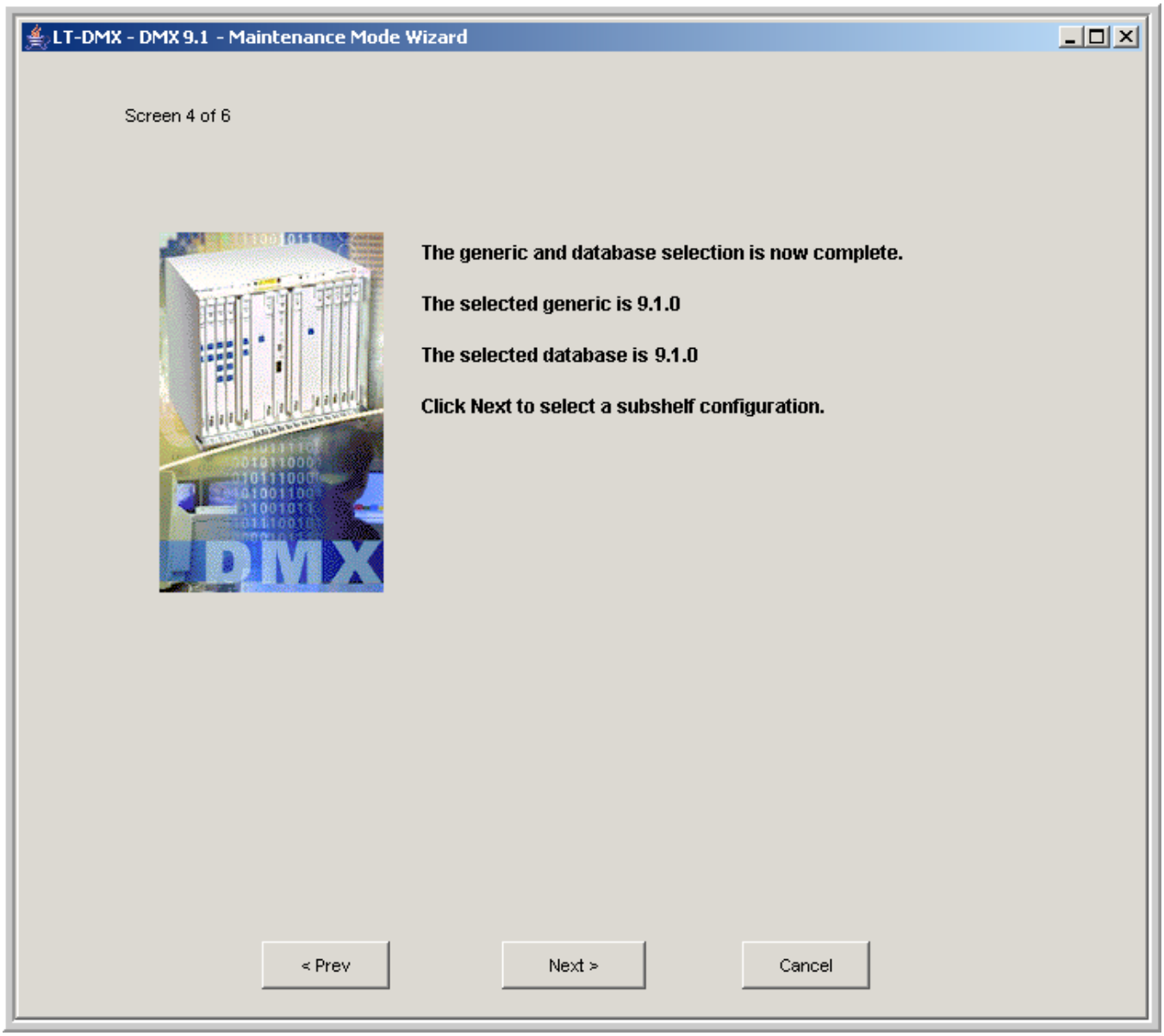
35 Do you wish to observe the FTP download progress?

If...	Then...
Yes	Proceed to Procedure 14-17: "Observe FTP progress" (p. 14-103) and then continue with Step 36.
No	Continue with Step 36.

36 Once the database download is complete, the following confirmation message appears. Click **Yes** to use the database that is now in the Backup area.

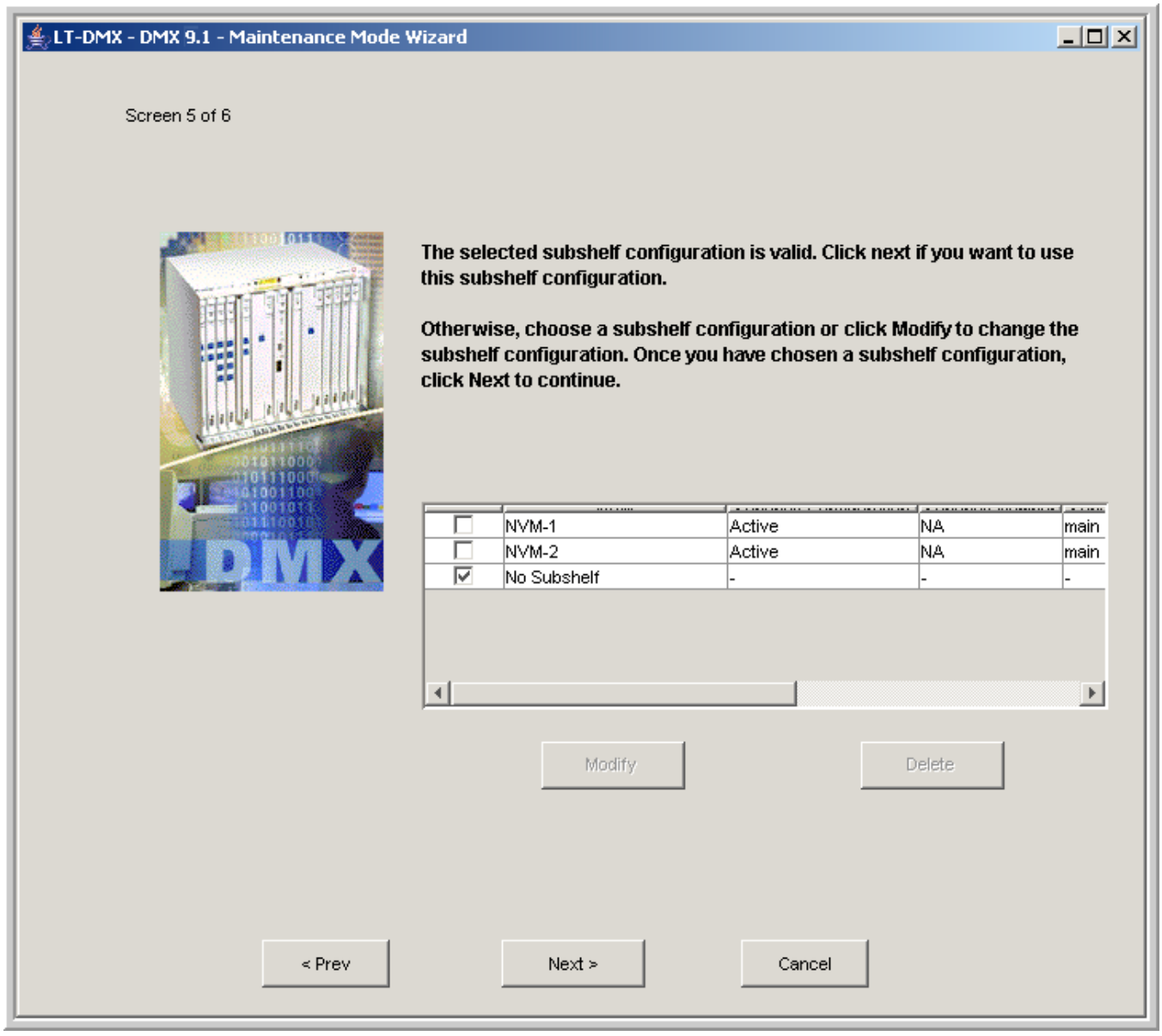


Result: Screen 4 of 6 in the Maintenance Mode Wizard appears. In this screen, 9.1.0 is an example; your selected generic could be different, for example 9.1.1.



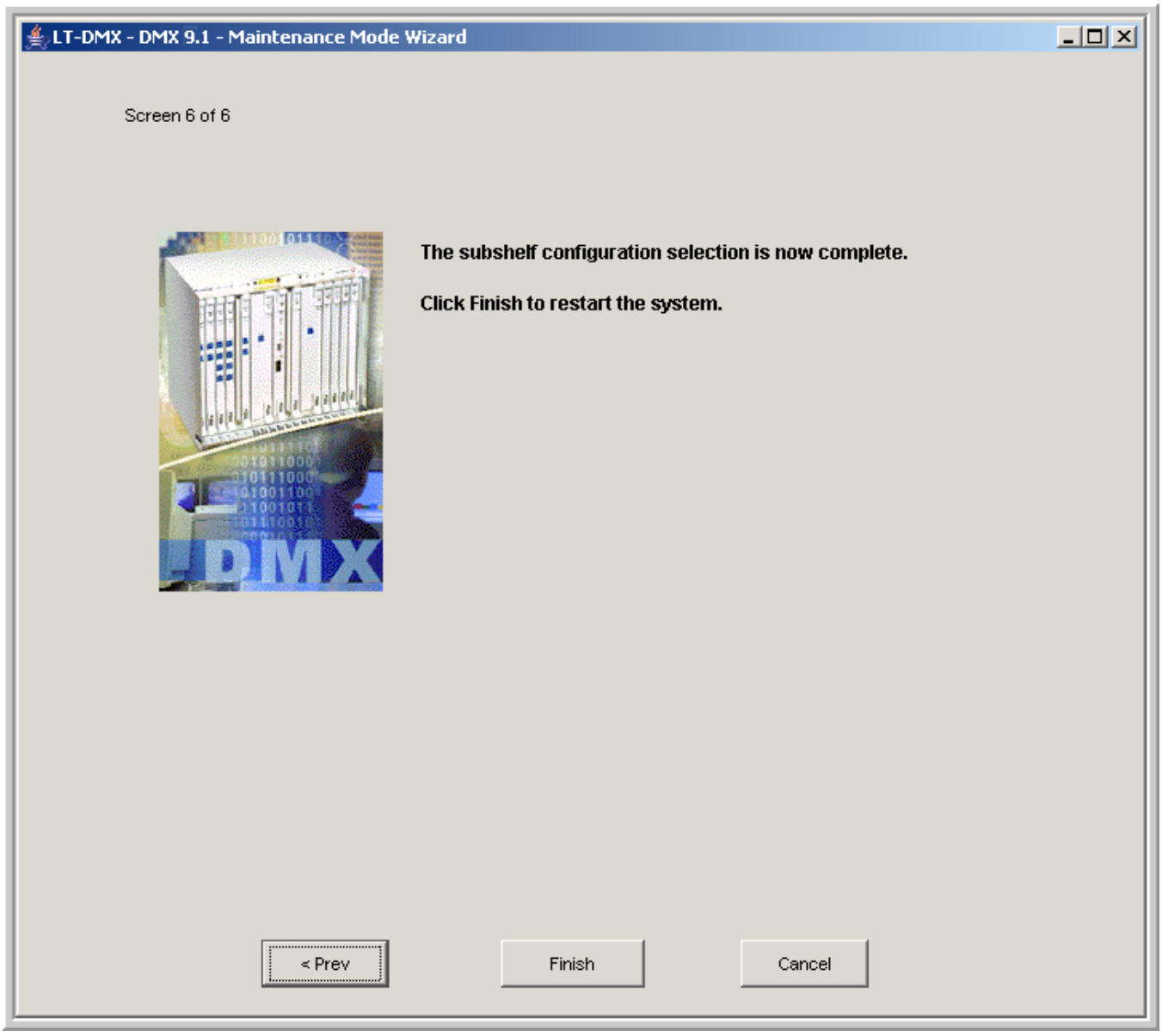
37 On Screen 4 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct 9.1.x generic and the default database, and click **Next** .

Result: Screen 5 of 6 in the Maintenance Mode Wizard appears.



38 On Screen 5 of 6 in the Maintenance Mode Wizard, select *No Subshelf* or select NVM 1 or 2 if this shelf will be a subshelf and click **Next** .

Result: Screen 6 of 6 in the Maintenance Mode Wizard appears.



39 On Screen 6 of 6 in the Maintenance Mode Wizard, read the information, verify that you have selected the correct generic and database and click **Finish** to restart the system and apply the generic and database.

Result: The Maintenance Mode Wizard closes and your connection to the shelf is terminated.

The LNW2 SYSCTL exhibits the following visible cycles while the generic and database are installed and validated and the SYSCTL reboots:

1. For approximately 20 minutes, the alternating **M** and **P** and **X** (X represents 6, 7, 8, or 9, depending on your Maintenance Mode) and "**.**" (" . " is a red, four-segment square [2 x 2] representing a period) and **Y** (Y represents 0 or 1, depending on your Maintenance Mode) continue to appear in the **IND** display on the SYSCTL.
2. After approximately 12 minutes, all LEDs extinguish and the **IND** display on the SYSCTL is blank for approximately 5 seconds.
3. A flashing **b** appears in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 60 seconds and then **IND** display is blank for approximately 20 seconds.
4. The **ACTIVE** LED lights and remains lighted.
5. A flashing **b** appears again in the **IND** display on the SYSCTL, indicating that a boot is in progress. The **b** continues flashing for approximately 2.5 minutes while the database is being converted and then **IND** display is blank.
6. When nothing appears in the **IND** display and the **ACTIVE** LED is lighted and the other LEDs return to their previous state (pre-backup), the NE software and database installation is complete.

   However, smart circuit packs may be upgrading their firmware. If flashing green **ACTIVE** LEDs are present on a circuit pack, firmware is currently being downloaded to that pack. Wait until all smart circuit packs finish upgrading their firmware before proceeding.

   If an alarm condition existed before the upgrade, the NE rediscovers the alarm condition and activates the appropriate LEDs on the shelf.
7. Continue with Step 40.

40 To verify that the upgrade was successful, depress and hold the **ACO TEST** push-button on the LNW2 SYSCTL for about 4 seconds.

Result: All LEDs on the shelf light. A red, 35-segment (5 x 7) rectangle appears in the **IND** display on the SYSCTL. Since the **IND** display is a 35-segment display, this test indicates all segments are working.

41 Proceed to Procedure 12-16.4: "Verify proper software generic" (p. 12-374).

END OF STEPS

Procedure 12-16.4: Verify proper software generic

Overview

Use this procedure to verify that the proper software generic is active on your SYSCTL and you can log in to the NE.

Required equipment

Refer to "Required equipment" (p. 12-324) in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324) for a list of equipment required to perform this procedure.

Before you begin

Prior to performing this procedure, complete Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324).

Steps

1 Release the **ACO TEST** push-button on the LNW2 SYSCTL when the red rectangle disappears in the **IND** display.

Result: The current software generic appears in the **IND** display on the LNW2 SYSCTL and the shelf LEDs return to their previous status.

2 From the Network View of the *WaveStar*® CIT session you established in Procedure 12-16: "Upgrade or replace SYSCTL (LNW2) circuit pack" (p. 12-324), select the **View:** pull-down menu and select **CIT OSI Neighbors**.

Important! This **View:** is not the menu bar item View → ...; it is located above the NE Name pull-down menu.

3 From the Network View, select **View** → **Refresh OSI View**.

Result: The CIT OSI neighbor(s) are automatically detected.

Your TID will be your original TID, the same TID provisioned on your NE prior to the SYSCTL replacement.

4 In the Network View, right-click the NE icon that was detected, and select **Graphical Using** → **OSI** from the resulting menu.

Result: The *System Type Selection* window appears.

5 In the *System Type Selection* window, select DMX and click **OK**.

Result: The *NE Login Dialog* window appears.

6 In the NE login window, login to the shelf using your original user ID and password; the same user ID and password provisioned prior to the SYSCTL replacement.

Click **OK**.

Result: The title bar of the System View and the legal notice text should both reflect the current NE software generic, for example: 9.1.0.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 Is the Generic Software Version correct?

If...	Then...
Yes	STOP! End of Procedure.
No	Contact your next level of support.

END OF STEPS

Procedure 12-17: Upgrade low-speed OLIU circuit packs (different slots)

Overview

Use this procedure to perform the following in-service, different-slot, low-speed OLIU circuit pack upgrades:

- low-density 4-port LNW36/LNW37 OC-3 OLIU to high-density 8-port LNW45 OC-3 OLIU
- LNW36/LNW37/LNW45 OC-3 OLIU to 12-port LNW55 OC3/OC12/OC48 OLIU
- low-density 2-port LNW46 OC-12 OLIU to high-density 4-port LNW49 OC-12 OLIU
- LNW46/LNW49 OC-12 OLIU to 12-port LNW55 OC3/OC12/OC48 OLIU
- LNW31 OC-48 OLIU to 12-port LNW55 OC3/OC12/OC48 OLIU

Traffic is bridged/rolled from the original OLIU circuit pack to the replacement circuit pack one port (unprotected applications) or port pair (1+1/UPRS protected applications) at a time.

Important! *This procedure does not support upgrading circuit packs with BLSR applications.* If the circuit packs to be upgraded have BLSR protected applications, refer to Procedure 12-18: “Upgrade low-speed OLIU circuit packs (same slots)” (p. 12-385).

Important! If upgrading to LNW55 OLIU circuit packs, the Main slots must be equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs. If the Main slots are not equipped with Very Large Fabric OLIU circuit packs, the system reports a `CP not allowed - eqpt` alarm.

Important! This is an out-of-slot upgrade at a node. An empty Function/Growth slot is required to upgrade an unprotected OLIU circuit pack. An empty Function/Growth group is required to upgrade protected OLIU circuit packs.

To perform an in-service, same-slot, low-speed OLIU circuit pack upgrade, refer to Procedure 12-18: “Upgrade low-speed OLIU circuit packs (same slots)” (p. 12-385).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- For unprotected applications, one replacement low-speed OLIU circuit pack and pluggable transmission modules.
- For protected applications, two replacement low-speed OLIU circuit pack and pluggable transmission modules.

The pluggable transmission modules installed in the original OLIU circuit packs may be reused in the replacement OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If upgrading from LNW36 OC-3 to LNW45 OC-3 OLIU circuit packs or from LNW46 OC-12 to LNW49 OC-12 OLIU circuit packs, transmission hits (up to 300 ms) may occur as traffic is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic, transmission hits occur as Ethernet traffic is rolled to the new slot. The length of transmission hits increase with the number of tributaries that need to be rolled to the new slot and could be several seconds long.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Ensure that the required replacement OLIU circuit packs and pluggable transmission modules are available for installation.
4. Verify that the work instructions specify the affected circuit pack and protection group AIDs (if required).
5. Verify that the work instructions specify the circuit pack/pluggable transmission module/port parameters and values to be provisioned.
6. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade low-speed OLIU circuit packs using different slots.

1 Install the required replacement OLIU circuit packs and pluggable transmission modules.

Important! The pluggable transmission modules installed in the original OLIU circuit packs may be moved to the replacement OLIU circuit packs later in this procedure when the optical fibers are moved.

Reference: Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17)

2 Using the work instructions, select **Configuration** → **Equipment** to access the replacement OLIU circuit packs and provision the required parameters for the circuit packs and each pluggable transmission module/port.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

3 Using the work instructions, select **Configuration** → **DCC Terminations** to access and provision each DCC port on the replacement OLIU circuit packs.

Reference: Procedure 6-4: “Provision DCC terminations” (p. 6-12)

4 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is an optical port on the OLIU circuit pack that is to be upgraded, the Optical Synchronization Source must be reprovisioned to an optical port on the replacement OLIU circuit pack or to a different optical port not involved in the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which optical port to provision as the new Optical Synchronization Source.

5 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different optical port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an optical port on the replacement OLIU circuit pack, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the replacement OLIU circuit pack.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different optical port not involved in the upgrade.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

6 **Important!** Traffic is moved from the original OLIU circuit pack to the replacement circuit pack one port (unprotected applications) or port pair (protected applications) at a time.

Using local procedures, determine the first port/port pair to be moved to the replacement OLIU circuit pack.

7 **Important!** All cross-connections that are associated with the OLIU circuit packs that are to be upgraded must be identified so that traffic can be moved to the replacement OLIU circuit packs.

Select **View** → **Cross-Connections** to access the OLIU circuit pack/port and obtain the current list of cross-connections for the port/port pair being moved. Identify and record all through, add, drop, and UPSR Dual Ring Interworking cross-connections. Click **Close** to exit.

Important! A UPSR Dual Ring Interworking cross-connection consists of a 1-way add, a 1-way through, and a 1-way path protected drop cross-connection. To verify that a cross-connection leg is part of a UPSR Dual Ring Interworking cross-connection, click on the cross-connection leg in the list of cross-connections and click **View Graphic**.

For additional information about UPSR Dual Ring Interworking cross-connections, refer to Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58).

Add cross-connections allow traffic to be added to tributaries on the optical port being upgraded.

Drop cross-connections allow traffic to be dropped from tributaries on the optical port being upgraded.

8 **Important!** If required by local procedures, manual protection switches may be performed at the terminating drop nodes and the other drop/continue node to switch Dual Ring Interworking traffic away from the node being upgraded.

If required, use circuit layouts and follow local procedures to identify the terminating nodes and the other drop/continue node for each *UPSR Dual Ring Interworking* cross-connection identified in Step 7. Select **Reports** → **Path Protection List** to verify the active/standby status of the required paths.

If required at each terminating node and the other drop/continue node, select **Fault** → **Protection Switch** to access the required paths and perform a Manual switch to switch Dual Ring Interworking traffic away from the node being upgraded.

9 For each *UPSR Dual Ring Interworking* cross-connection identified in Step 7, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the UPSR Dual Ring Interworking cross-connections. Then use the *Cross-Connection Wizard* to create the same UPSR Dual Ring Interworking cross-connections on the replacement OLIU circuit packs.

Result: Alarms may be reported at other nodes in the network.

Reference: Procedure 10-11: "Establish dual ring interworking (DRI) connections" (p. 10-58)

10 **Important!** Do *not* perform this step for a 1-way through cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *through* cross-connection identified in Step 7 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to create the same through cross-connections on the replacement OLIU circuit packs.

Reference: Procedure 10-5: "Make VT1.5 or STS-n cross-connections, single OC-3/OC-12 UPSR configuration" (p. 10-17)

11 **Important!** Do *not* perform this step for a 1-way add cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *add* cross-connection identified in Step 7 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the required optical ports on the replacement OLIU circuit packs just installed.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

12 **NOTICE**

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the OLIU circuit pack/port being upgraded.

If the OLIU circuit pack/port is...	Then...
protected,	Disconnect the transmit/receive optical fibers, LBO, and pluggable transmission module (if required) from the required OLIU circuit pack/port in slot 1 of the Function/Growth group.
unprotected,	Disconnect the transmit/receive optical fibers, LBO, and pluggable transmission module (if required) from the required OLIU circuit pack/port.

Result: The system reports `inc. LOS` alarms for the optical ports on the OLIU circuit pack.

If the OLIU circuit pack is protected, transmission hits (less than 60 ms) may occur.

If the OLIU circuit pack is unprotected, service is interrupted until the fibers are reconnected and the traffic is rolled to the replacement OLIU circuit pack.

Alarms may be reported at other nodes in the network.

13 If required, measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs/pluggable transmission modules.)

14

If the OLIU circuit pack/port is...	Then...
protected,	Clean all fiber connectors. Connect the pluggable transmission module (if required), LBO, and transmit/receive optical fibers to the replacement OLIU circuit pack/port in slot 1 of the other Function/Growth group.
unprotected,	Clean all fiber connectors. Connect the pluggable transmission module (if required), LBO, and transmit/receive optical fibers to the required replacement OLIU circuit pack/port.

Reference:

- Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

15 **Important!** Do *not* perform this step for a 1-way path protected drop cross-connection associated with a UPSR Dual Ring Interworking cross-connection.

For each *drop* cross-connection identified in Step 7 that is *not* part of a UPSR Dual Ring Interworking cross-connection, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the required optical ports on the replacement OLIU circuit packs just installed.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

16

If the OLIU circuit pack/port is...	Then...
protected,	Continue with the next step.
unprotected,	Proceed to Step 20.

17



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the OLIU circuit pack/port being upgraded.

Disconnect the transmit/receive optical fibers, LBO, and pluggable transmission module (if required) from the required OLIU circuit pack/port in slot 2 of the Function/Growth group.

Result: The system reports `inc. LOS` alarms for the optical ports on the OLIU circuit pack.

Alarms may be reported at other nodes in the network.

18 If required, measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs/pluggable transmission modules.)

19 Clean all fiber connectors. Connect the pluggable transmission modules (if required), LBOs, and transmit/receive optical fibers to the replacement OLIU circuit pack/port in slot 2 of the other Function/Growth group.

Reference:

- Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

20 Select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add and through cross-connections to the original optical port on the OLIU circuit packs.

21 If required at each Dual Ring Interworking terminating node and the other drop/continue node, select **Fault** → **Protection Switch** to access the required paths and Reset any Manual switches performed in this procedure.

22 If required, repeat Step 7 through Step 21 to move traffic from another port/port pair on the original OLIU circuit pack to a port/port pair on the replacement OLIU circuit pack; otherwise, continue with the next step.

23 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to an optical port on a replacement OLIU circuit pack.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to an optical port on a replacement OLIU circuit pack.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

24 If required, remove the original OLIU circuit packs from the shelf.

Result: The system reports `CP removed or CP failure` alarms.

25 Select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

All alarms clear.

26 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155)
- Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167)
- Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182)
- Procedure 2-9: "Backup and restore NE database using SFTP" (p. 2-144)

END OF STEPS

Procedure 12-18: Upgrade low-speed OLIU circuit packs (same slots)

Overview

Use this procedure to perform the following in-service, same-slot, low-speed OLIU circuit pack upgrades:

- low-density 4-port LNW36/LNW37 OC-3 OLIU to high-density 8-port LNW45 OC-3 OLIU
- LNW36/LNW37/LNW45 OC-3 OLIU to 12-port LNW55 OC3/OC12/OC48 OLIU
- low-density 2-port LNW46 OC-12 OLIU to high-density 4-port LNW49 OC-12 OLIU
- LNW46/LNW49 OC-12 OLIU to 12-port LNW55 OC3/OC12/OC48 OLIU
- LNW31 OC-48 OLIU to 12-port LNW55 OC3/OC12/OC48 OLIU

Important! If upgrading to LNW55 OLIU circuit packs, the Main slots must be equipped with Very Large Fabric LNW59, LNW82, or LNW504 OLIU circuit packs. If the Main slots are not equipped with Very Large Fabric OLIU circuit packs, the system reports a `CP not allowed - eqpt` alarm.

Important! To perform an in-service, different-slot, low-speed OLIU circuit pack upgrade, refer to Procedure 12-17: “Upgrade low-speed OLIU circuit packs (different slots)” (p. 12-376).

Upgrades to multiport circuit packs

When upgrading to a circuit pack with more ports, the cross-connections on the original port are mapped to the same port number on the upgrade circuit pack. The upgrade circuit pack must also be configured with compatible pluggable transmission modules that match the port signal rates on the original circuit pack.

The additional ports on the upgrade circuit pack cannot be used until after the upgrade is completed. After the upgrade is completed, the remaining ports may be configured for any of the available port signal rates allowed for the circuit pack.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Two replacement low-speed OLIU circuit pack and pluggable transmission modules.

The pluggable transmission modules installed in the original OLIU circuit packs may be reused in the replacement OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Since low-speed OLIU circuit packs may have unprotected 0x1 ports, any unprotected 0x1 ports will experience a service outage during this procedure.

This in-service upgrade is intended to be used with only ports carrying service protected traffic.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If upgrading from LNW36 OC-3 to LNW45 OC-3 OLIU circuit packs or from LNW46 OC-12 to LNW49 OC-12 OLIU circuit packs, transmission hits (up to 300 ms) may occur as traffic is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure, and verify that the affected circuit pack/protection group AIDs are specified.
3. Verify that the circuit packs to be upgraded are protected. Both slots/ports in the Function/Growth group must be equipped before performing this procedure. If necessary, install the companion circuit pack/pluggable transmission module. Refer to Procedure 4-3: "Install OLIU circuit packs in Function slots" (p. 4-17) and/or Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.
5. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack/port active/standby status, perform manual switches if the ports are active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade low-speed OLIU circuit packs using the same slots.

1 Log in to the node where the low-speed OLIU circuit packs are to be replaced.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Using the *WaveStar*® CIT verify the status of the node to be upgraded.

Reference: Procedure 12-18.1: "Verify status of node to be upgraded" (p. 12-392)

3 If required, verify the active/standby status of the OLIU circuit pack/ports in slot 1 of the Function/Growth group and perform manual switches to switch traffic away from an active OLIU circuit pack/port.

Reference: Procedure 12-18.2: “Verify active/standby status of circuit pack/ports to be replaced” (p. 12-393)

4 

NOTICE

Service-disruption hazard

If the OLIU circuit pack in slot 1 of the Function/Growth group has unprotected 0x1 ports, a service outage will occur from the time that the OLIU circuit pack is removed until the replacement OLIU circuit pack is installed with fibers reconnected and a system update is successfully executed.

This in-service upgrade is intended to be used with only ports carrying service protected traffic.

Important! The OLIU circuit pack in slot 1 of the Function/Growth group must be replaced first.

Disconnect the optical fibers from the OLIU circuit pack in slot 1 of the Function/Growth group. If the ports are active for transmission, disconnecting the optical fibers causes transmission switches. Open the lower faceplate latch on the OLIU circuit pack in slot 1 of the Function/Growth group. Then replace the l OLIU circuit pack in slot 1 of the Function/Growth group with the replacement OLIU circuit pack.

Result: Transmission hits (less than 60 ms) may occur if traffic exists on the OLIU circuit pack in slot 1 of the Function/Growth group. If through traffic exists (USPRs and BLSRs only), transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped.

If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement OLIU circuit pack is installed. After the circuit pack firmware update is complete, the system reports an `unexpected CP type` alarm for slot 1 of the Function/Growth group.

If a circuit pack firmware update is not required, the system reports an `unexpected CP type` alarm for slot 1 of the Function/Growth group when the replacement OLIU circuit pack is installed.

If upgrading to LNW55 OLIU circuit packs, the system reports a `CP removed or CP failure` alarm for approximately 4 minutes before reporting the `unexpected CP type` alarm.

For any affected BLSR protection groups, a `Line Automatic Switch` condition is also reported for slot 1 of the Function/Growth group.

Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

5 If required, measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs/pluggable transmission modules.)

6 Clean all fiber connectors. Connect the pluggable transmission modules, LBOs, and transmit/receive optical fibers to the replacement OLIU circuit pack in slot 1 of the Function/Growth group.

Reference:

- Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

7 

NOTICE

Service-disruption hazard

If the OLIU circuit pack in slot 2 of the Function/Growth group has unprotected 0x1 ports, a service outage will occur from the time that a system update is successfully executed until the replacement OLIU circuit pack is installed and fibers are reconnected.

This in-service upgrade is intended to be used with only ports carrying service protected traffic.



NOTICE

Service-disruption hazard

If upgrading from LNW36 OC-3 to LNW45 OC-3 OLIU circuit packs or from LNW46 OC-12 to LNW49 OC-12 OLIU circuit packs, transmission hits (up to 300 ms) may occur as traffic is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OLIU circuit pack/pluggable transmission modules in slot 1 of the Function/Growth group is tested and autoprovisioned.

The system performs automatic protection switches. Transmission hits (less than 60 ms) occur as traffic is automatically switched from the OLIU circuit pack in slot 2 to the replacement OLIU circuit pack/pluggable transmission modules in slot 1 of the Function/Growth group.

All traffic is now active on the replacement OLIU circuit pack/pluggable transmission modules in slot 1 of the Function/Growth group.

The `unexpected CP type` alarm for slot 1 clears, and the system reports an `CP not allowed - eqpt` alarm for slot 2.

For any affected BLSR protection groups, the `Line Automatic Switch` condition for slot 1 clears, and the system reports an `Line Automatic Switch` condition for slot 2.

Alarms may also be reported at other nodes in the network.

8 Disconnect the optical fibers from the OLIU circuit pack in slot 2 of the Function/Growth group. Open the lower faceplate latch on the OLIU circuit pack in slot 2 of the Function/Growth group. Then replace the OLIU circuit pack in slot 2 with the replacement OLIU circuit pack.

Result: The replacement OLIU circuit pack in slot 2 is tested and autoprovisioned.

If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement OLIU circuit pack is installed. After the circuit pack firmware update is complete, the `CP not allowed - eqpt` alarm for slot 2 clears, and the system reports an `inc. LOS` alarm for slot 2.

If a circuit pack firmware update is not required, the `CP not allowed - eqpt` alarm for slot 2 clears, and the system reports an `inc. LOS` alarm for slot 2.

Reference: Procedure 4-3: “Install OLIU circuit packs in Function slots” (p. 4-17)

9 If required, measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OLIU circuit packs/pluggable transmission modules.)

10 Clean all fiber connectors. Connect the pluggable transmission modules, LBOs, and transmit/receive optical fibers to the replacement OLIU circuit pack in slot 2 of the Function/Growth group.

Result: All alarms clear and service is restored.

Reference:

- Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)
- Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

11 **Important!** If the Main slots are equipped with VLF OLIU circuit packs, the replacement OLIU circuit packs do not support backplane optimization.

If required, select **Configuration** → **Optimize Backplane Bandwidth** to access the replacement OLIU circuit packs and optimize the backplane bandwidth between the replacement OLIU circuit packs and the non-VLF OLIU circuit packs in the Main slots.

Reference: Procedure 6-12: "Optimize backplane bandwidth" (p. 6-44)

12 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155)
- Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167)
- Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182)
- Procedure 2-9: "Backup and restore NE database using SFTP" (p. 2-144)

13 This completes the circuit pack upgrade at the local node. If required, repeat this procedure to upgrade another node.

END OF STEPS

Procedure 12-18.1: Verify status of node to be upgraded

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Complete the following steps to verify the status of the node to be upgraded

1 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

END OF STEPS

Procedure 12-18.2: Verify active/standby status of circuit pack/ports to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack/ports to be replaced and perform manual switches to switch traffic away from an active circuit pack/port.

1 **Important!** If the circuit pack to be replaced has active ports for transmission and the optical fibers are disconnected, the system performs automatic protection switches and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the ports on the circuit pack to be replaced.

Select **View** → **Protection** to access the required protection groups (according to the work instructions) and determine the active lines/paths supported by the circuit pack to be replaced. Record the active lines/paths supported by the circuit pack to be replaced. Click **Close**.

2 **Important!** If the circuit pack to be replaced has active ports for transmission, optional manual switches can be performed before replacing the circuit pack. In UPSRs, each path supported by the circuit pack to be replaced must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced does *not* have active ports for transmission, proceed to Step 4.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**.

If the required port is part of a ...	Then ...
UPSR protection group,	Expand *Path Protection*, select the required path and click **Select**. Select the *Manual* Switch Type and click **Apply**.

If the required port is part of a ...	Then ...
BSLR protection group,	Select the required *2F BLSR* line and click **Select**. Select the Direction for the circuit pack to be replaced (West for slot 1 or East for slot 2) and *Manual to Protection, Ring* Switch Type, and click **Apply**.
1+1 protection group,	Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

If a UPSR or 1+1 protection group, the system reports a `manual switch` condition.

If a BLSR protection group, the system reports the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

3 Repeat Step 2 for each protection group that has an active port on the circuit pack to be replaced. Click **Close**.

4 If required, repeat Step 1 to verify that the circuit pack to be replaced does *not* have active ports for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-19: Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR

Overview

Important! The UPSR must be equipped with Alcatel-Lucent 1665 DMX nodes only. This upgrade procedure does *not* support upgrading UPSRs equipped with nodes other than Alcatel-Lucent 1665 DMX.

Use this procedure to upgrade an in-service non Very Large Fabric (VLF) OC-48 UPSR to a VLF OC-192 UPSR. To upgrade an in-service non-VLF OC-48 UPSR to a non-VLF OC-192 UPSR, refer to Procedure 12-8: "Upgrade OC-48 UPSR to OC-192 UPSR" (p. 12-171).

This procedure supports upgrading UPSR nodes equipped with non-VLF LNW27, LNW29, LNW32, LNW56, LNW57, LNW58, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit packs to VLF LNW59 and LNW504 OC-192 OLIU circuit packs.

Any UPSR nodes equipped with LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack must be upgraded to LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack before performing this procedure. Refer to Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5).

The non-VLF OC-48 OLIU circuit packs in the Main slots are upgraded at each node. This procedure assumes that in the UPSR, the circuit pack in Main slot **M1** is always connected to the circuit pack in Main slot **M2** of the adjacent node. (Refer to the "UPSR example" (p. 12-409) at the end of the procedure.)

Important! The Very Large Fabric circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The Standard Alcatel-Lucent 1665 DMX Shelf does not support upgrades to Very Large Fabric circuit packs.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Ring Upgrade Mode

During the upgrade, each node connected to the UPSR using the Main slots must be provisioned in the Ring Upgrade Mode. The Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack and prohibits the following operations:

- Software upgrades to the node (**`APPLY`**, **`INS-PRGM`**)
- Cross-connection provisioning (**`ENT-CRS`**, **`DLT-CRS`**)
- Manual equipment protection switching of the Function/Growth slots (**`SW-TOPROTN`**, **`SW-TOWKG`**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded ring, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Upgrades to multiport circuit packs

When upgrading to a circuit pack with more ports, the cross-connections on the original port are mapped to the same port number on the upgrade circuit pack. The upgrade circuit pack must also be configured with compatible pluggable transmission modules. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics.

The additional ports on the upgrade circuit pack cannot be used until after the upgrade is completed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, “System configuration procedures”.

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- The following lightguide buildouts (LBOs) should be available:
  - 5-dB loss LBO (code ABLCS-05.0: comcode 108279381)
  - 10-dB loss LBO (code ABLCS-10.0: comcode 108279431)
  - 15-dB loss LBO (code ABLCS-15.0: comcode 108279480)
- Lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269)
- As optical spans are upgraded around the UPSR, ensure that technicians are available at each end of an optical span as it is upgraded.

- If Main slot **M1** at the first node to be upgraded is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack, *one* Series 1:6 or later version of the same OC-48 OLIU circuit pack type is temporarily required. For example if the first node to be upgraded is equipped with pre Series 1:6 LNW27 OC-48 OLIU circuit packs, then 1 Series 1:6 or later LNW27 OC-48 OLIU circuit pack is temporarily required.
- One temporary replacement non-VLF LNW56 OC-192 OLIU circuit pack is required for Main slot **M2** at the first node to be upgraded. The temporary replacement non-VLF LNW56 OC-192 OLIU circuit pack is intended for use only as the temporary transition circuit pack during ring upgrades.

  A non-VLF LNW57, LNW58, LNW502, or LNW555 OC-192 OLIU circuit pack may also be used as the temporary replacement non-VLF OC-192 OLIU circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.
- Two replacement VLF LNW59 OC-192 OLIU circuit packs for each node.

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.

  Important! Release 7.1.1 or later software is required to support upgrades to VLF LNW59 OC-192 OLIU circuit packs.

  Release 9.0 or later software is required to support upgrades to VLF LNW504 OC-192 OLIU circuit packs.

  Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

Transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the UPSR and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-192 OLIU circuit packs. Ensure that the OC-192 OLIU circuit packs are compatible with each fiber span in the UPSR. Attenuation and Dispersion may be limiting factors at longer span lengths.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.
5. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service non-VLF OC-48 UPSR to an VLF OC-192 UPSR.

1 From office records and work instructions, determine the current network configuration. Note how the nodes are connected in the ring and make a drawing of the ring to reference during this upgrade procedure.

2 Log in to a node in the UPSR to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

5 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

6 **Important!** Nodes must be equipped with LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs in the Main slots. Upgrades from LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs directly to VLF OC-192 OLIU circuit packs are not supported.

Select **Reports** → **Equipment Lists**→ **Pack**. Click **Shelf** and **Select** to access the *Circuit Pack List* and verify that the shelf is not equipped with LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIUs.

If required, upgrade the node with LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs.

Reference: Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5)

7 **Important!** If the network element is equipped with LNW6 or LNW7 28DS1 circuit packs, attempts to upgrade from non-VLF OLIU circuit packs to VLF OLIU circuit packs are denied.

Select **Reports** → **Equipment Lists**→ **Pack**. Click **Shelf** and **Select** to access the *Circuit Pack List* and verify that the shelf is not equipped with LNW6 or LNW7 28DS1 circuit packs.

If required, replace the LNW6 or LNW7 28DS1 circuit packs.

Reference: Procedure 12-15: "Upgrade low-speed electrical circuit packs" (p. 12-317)

8 At each of the remaining nodes in the UPSR, log in to the node and repeat Step 2 through Step 7. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9 

NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-19.4: "Verify spanning tree configuration" (p. 12-419)

10 Identify and log in to the starting node. (Refer to the "UPSR example" (p. 12-409) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

11 Determine the OC-48 OLIU circuit pack types installed in the Main slots of the starting node using **Reports** → **Equipment Lists** → **Packs**. Click *Shelf* and **Select**. Observe the *Apparatus Code* and *Series Number* of the *main-1* and *main-2* circuit packs. Click **Close**.

12 **Important!** If Main slot **M1** of the starting node is equipped with a pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type. The Series 1:6 or later OC-48 OLIU circuit pack maintains traffic while Main slot **M2** and the other nodes in the ring are upgraded. As a final step, the Series 1:6 or later OC-48 OLIU circuit pack is upgraded.

If required, replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Reference: Procedure 12-19.1: "Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node" (p. 12-411)

13 If required, verify the active/standby status of the non-VLF OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-19.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-413)

14 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View at the starting node, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-396).

15 

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Important! The non-VLF OC-48 OLIU circuit pack in Main slot **M2** *must* be replaced with a temporary replacement non-VLF OC-192 OLIU circuit pack. (Refer to "Required equipment" (p. 12-397) for a list of acceptable temporary replacement non-VLF OC-192 OLIU circuit packs.) The temporary replacement non-VLF OC-192 OLIU circuit pack maintains traffic while Main slot **M1** and the other nodes in the ring are upgraded. As a final step, this temporary replacement non-VLF OC-192 OLIU circuit pack is upgraded

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement non-VLF OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the temporary replacement non-VLF OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

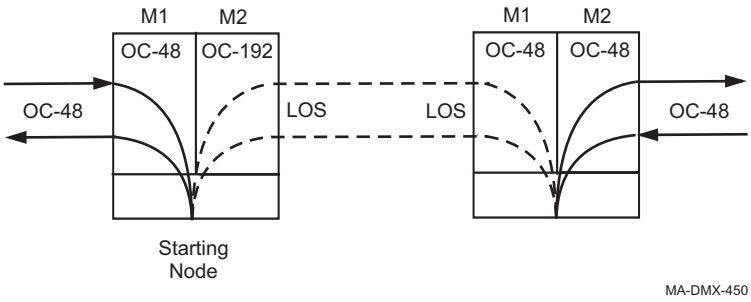
The system reports an `unexpected circuit pack type` *condition* and an `OC48 LOS` alarm for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

This completes the first phase of the UPSR upgrade at the starting node. The starting node upgrade will be completed after all the other nodes in the ring are upgraded.

The following figure shows the state of the starting node and the adjacent optical spans.



16 Log in to the adjacent node connected to Main slot **M2**. (Refer to the “UPSR example” (p. 12-409) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

17 Upgrade the high-speed non-VLF OC-48 UPSR connections at the node to VLF OC-192 UPSR connections.

Reference: Procedure 12-19.3: "Upgrade high-speed UPSR connections at node using VLF OC-192 OLIU circuit packs" (p. 12-415)

18 Except for the starting node, have all nodes in the UPSR been upgraded?

If...	Then...
No	Repeat Step 16 and Step 17 as required at the next node. (Refer to the "UPSR example" (p. 12-409) at the end of the procedure.)
Yes	Continue with Step 19.

19 Log in to the starting node. (Refer to the "UPSR example" (p. 12-409) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

20 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

21 If required, verify the active/standby status of the non-VLF OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-19.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-413)

22 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M1** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected circuit pack type` *alarm* for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

23 At both ends of the optical span to be upgraded, perform the following to connect the replacement VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the upgraded OC-192 optical span, the `inc. OC192 LOS` alarm clears.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

24 

NOTICE

Service-disruption hazard

Transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected circuit pack type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the upgraded optical span between Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span.

25 Open the lower faceplate latch on the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the temporary replacement non-VLF OC-192 OLIU circuit pack circuit pack in Main slot **M2**. Then replace the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

26 At both ends of the optical span to be upgraded, perform the following to connect the replacement VLF OC-192 OLIU circuit pack in Main slot **M2** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC192 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

27 **Important!** At each node in the UPSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the UPSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

28 **Important!** The network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node cannot be returned to the pre-upgrade state using the backout procedure.

At each node in the UPSR, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

29 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the UPSR, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)

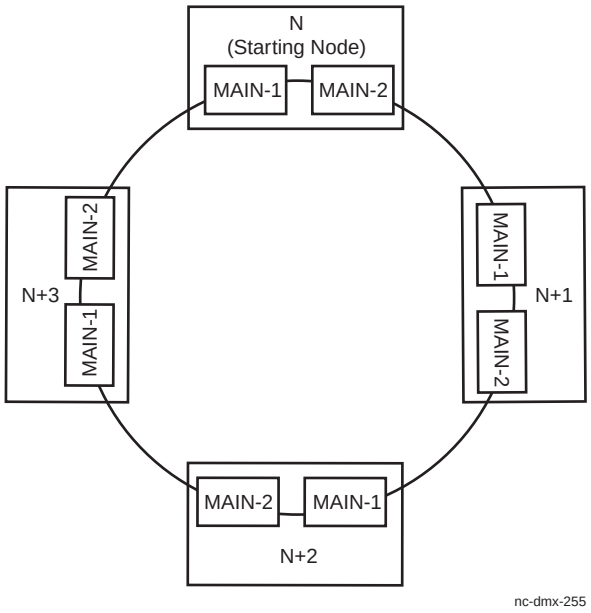
END OF STEPS

UPSR example

Starting Node: Alcatel-Lucent 1665 DMX Node N

Starting Circuit Pack: Main-2 at the Starting Node

Direction of Upgrade: Clockwise around UPSR from Main-2 at the Starting Node to Main-1 at the adjacent node


N
(Starting Node)
MAIN-1
MAIN-2
N+1
MAIN-1
MAIN-2
N+2
MAIN-2
MAIN-1
N+3
MAIN-2
MAIN-1
nc-dmx-255

Procedure 12-19.1: Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-19.2: “Verify active/standby status of circuit pack to be replaced” (p. 12-413)

2 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the pre Series 1:6 LNW27, 29, 76, or 221–259 OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Result: The Series 1:6 or later version OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `inc. OC48 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-19.2: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack to be replaced (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack to be replaced). Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, optional manual switches can be performed before replacing the circuit pack. In UPSRs, each path supported by the circuit pack to be replaced must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack to be replaced. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-19.3: Upgrade high-speed UPSR connections at node using VLF OC-192 OLIU circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade the in-service high-speed non-VLF OC-48 UPSR connections at a node using VLF OC-192 OLIU circuit packs.

1 If required, verify the active/standby status of the non-VLF OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-19.2: “Verify active/standby status of circuit pack to be replaced” (p. 12-413)

2 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to “Ring Upgrade Mode” (p. 12-396).

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M1** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected circuit pack type` *alarm* for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be upgraded, perform the following to connect the replacement VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the upgraded OC-192 optical span, the `inc. OC192 LOS` alarm clears.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5



NOTICE

Service-disruption hazard

Transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the upgraded optical span between Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span.

6



NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

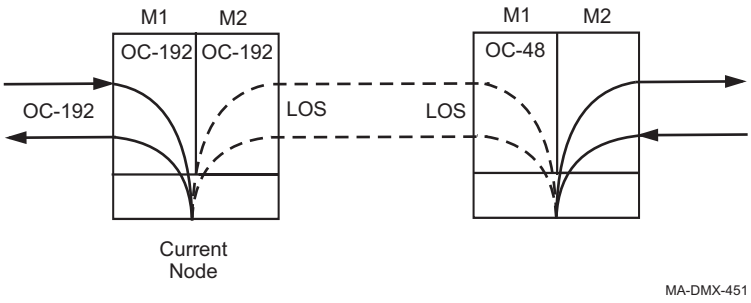
Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Open a faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M2** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-19.4: Verify spanning tree configuration

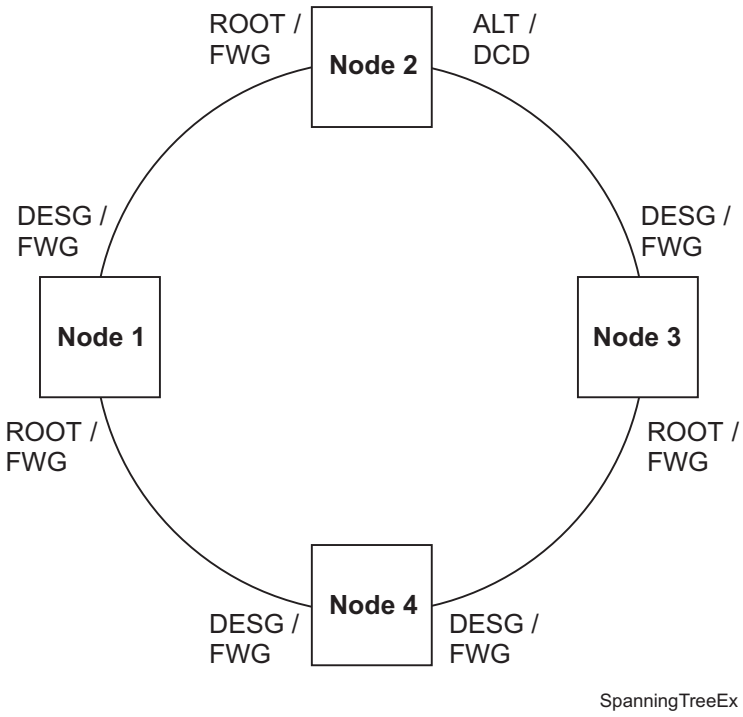
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-419).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

If required, change the existing spanning tree configuration.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-20: Back out non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out a non Very Large Fabric (VLF) OC-48 to VLF OC-192 UPSR upgrade.

Backing out of an upgrade in progress returns *all* nodes in the ring to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-21: “Suspend non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade” (p. 12-436).

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original non-VLF OC-48 OLIU circuit packs for each node to be backed out
- The temporary replacement non-VLF OC-192 OLIU circuit pack is required for Main slot **M2** of the starting node.
- As the upgrade is backed out around the UPSR, ensure that technicians are available at each end of an optical span as the upgrade is backed out.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.
3. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an non-VLF OC-48 to VLF OC-192 UPSR upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the starting node, and the ring upgrade is complete (all nodes are in the Ring Upgrade Mode),	Log in to the starting node (refer to the "UPSR example" (p. 12-430) at the end of the procedure) and continue with Step 3.
not the starting node,	Log in to the last node upgraded (refer to the "UPSR example" (p. 12-430) at the end of the procedure) and proceed to Step 11.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 If required, verify the active/standby status of the VLF OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-20.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-434)

4 Using office records, determine the original/temporary replacement non-VLF OC-48 OLIU circuit pack types installed in the Main slots and the temporary replacement non-VLF OC-192 OLIU circuit pack installed in Main slot **M2**.

5 **Important!** The VLF OC-192 OLIU circuit pack in Main slot **M2** of the starting node must be replaced with the temporary replacement non-VLF OC-192 OLIU circuit pack. The temporary replacement non-VLF OC-192 OLIU circuit pack maintains

traffic while the upgrade is backed out at Main slot **M1** and the other nodes in the ring. As a final step, this temporary replacement non-VLF OC-192 OLIU circuit pack is backed out.

Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M2**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M2** with the temporary replacement non-VLF OC-192 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

6 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.

7 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the optical span between Main slot **M2** and the required OC-192 circuit pack/port at the opposite end of the OC-192 optical span.

9 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

Open the lower faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the required non-VLF OC-48 OLIU circuit pack (Series 1:6 or greater).

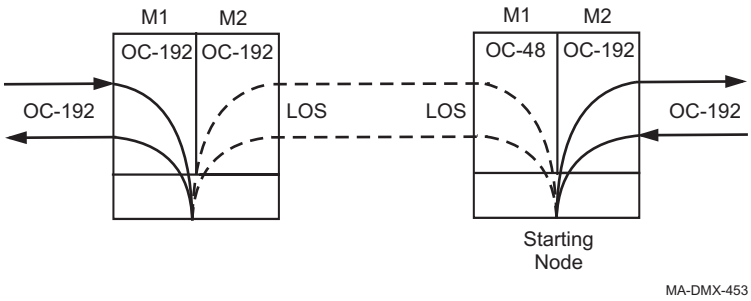
Result: The original non-VLF OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` *condition* and an `inc. OC192 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

This completes the first phase of backing out the upgrade at the starting node. Backing out the upgrade at the starting node will be completed after backing out the upgrade at all other nodes in the ring.

The following figure shows the state of the starting node and the adjacent optical spans.



10 Log in to the adjacent node connected to Main slot **M1**. (Refer to the “UPSR example” (p. 12-430) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

11 Back out the high-speed VLF OC-192 UPRS upgrade connections at the node to the original non-VLF OC-48 UPSR connections.

Reference: Procedure 12-20.1: "Back out high-speed non-VLF OC-48 to VLF OC-192 UPSR upgrade at node" (p. 12-431)

12 Except for the starting node, has the upgrade been backed out of all nodes in the UPSR?

If...	Then...
No	Repeat Step 10 through Step 11 as required at the next node. (Refer to the "UPSR example" (p. 12-430) at the end of the procedure.)
Yes	Continue with Step 13.

13 Log in to the starting node. (Refer to the "UPSR example" (p. 12-430) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

14 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M2**.

15 If required, verify the active/standby status of the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-20.2: “Verify active/standby status of circuit pack to be replaced” (p. 12-434)

16 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**. Then replace the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** with the original non-VLF OC-48 OLIU circuit pack.

Result: The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

17 At both ends of the optical span to be backed out, perform the following to connect the original non-VLF OC-48 circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-48 optical span.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

18 **Important!** At each node in the UPSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the UPSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 **Important!** This completes the backout procedure, except for taking the nodes out of the Ring Upgrade Mode. The decision to take the nodes out of the Ring Upgrade Mode or leave them depends on the reason the back out was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, UPSR cross-connections cannot be created or removed.

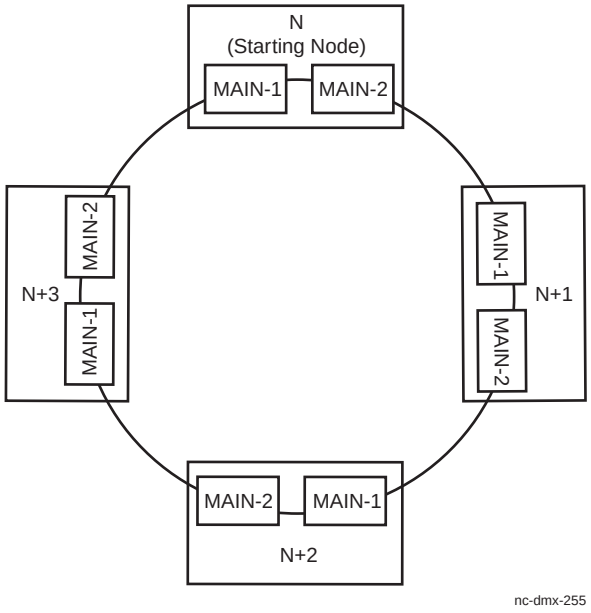
If required at each node in the UPSR, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

UPSR example



Procedure 12-20.1: Back out high-speed non-VLF OC-48 to VLF OC-192 UPSR upgrade at node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out a non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade at a node.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with VLF OC-192 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been upgraded with an VLF OC-192 OLIU circuit pack,	Proceed to Step 5.

2 If required, verify the active/standby status of the VLF OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-20.2: “Verify active/standby status of circuit pack to be replaced” (p. 12-434)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M2**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M2** with the original non-VLF OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be backed out, perform the following to connect the original non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the original optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span.

6 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

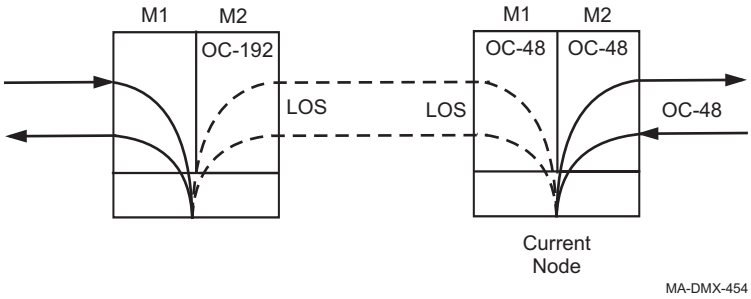
Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the original non-VLF OC-48 OLIU circuit pack.

Result: The original non-VLF OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-20.2: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **Reports** → **Path Protection List** and observe the value of the *Current Role* parameter for the *m()-()-()* paths supported by the circuit pack to be replaced (*Ring 1* for slot **M1** or *Ring 2* for slot **M2**). Record the active paths supported by the circuit pack to be replaced). Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, optional manual switches can be performed before replacing the circuit pack. In UPSRs, each path supported by the circuit pack to be replaced must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Expand *Path Protection*, click on the required *m-1-()* path and **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system reports a `manual switch` condition for the affected path.

6 Repeat Step 5 for each path supported by the circuit pack to be replaced. Click **Close**.

7 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete backing out the UPSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-21: Suspend non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to temporarily suspend a non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade.

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the ring to their pre-upgrade state, refer to Procedure 12-20: “Back out non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade” (p. 12-423).

When the ring upgrade is temporarily suspended before completion, some spans are operating at the OC-48 line rate and some at the OC-192 line rate. This requires two nodes that are equipped with an OC-48 OLIU circuit pack in one Main slot and an OC-192 OLIU circuit pack in the other Main slot. These nodes are the starting node and the last node upgraded.

To continue to operate temporarily with different circuit packs in the Main slots, the starting node and the nodes that have been upgraded must remain in the Ring Upgrade Mode.

> **Important!** Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- One original or temporary replacement LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack is required for Main slot **M2**.
- One temporary replacement non-VLF LNW56, LNW57, LNW58, LNW502, or LNW555 OC-192 OLIU circuit pack is required for Main slot **M1**.

The temporary replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 and OC-192 OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this suspend procedure.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to temporarily suspend a non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade.

1 Identify the last node that was upgraded.

If...	Then log in to the...
both Main slots have been upgraded,	last node upgraded (refer to the "UPSR example" (p. 12-446) at the end of the procedure) and continue with Step 2.
Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack	last node upgraded (refer to the "UPSR example" (p. 12-446) at the end of the procedure) and proceed to Step 11.
Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack	last node upgraded (refer to the "UPSR example" (p. 12-446) at the end of the procedure) and proceed to Step 17.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 **Important!** Both Main slots have been upgraded. All traffic is now active on Main slot **M1**, and the system is reporting an `inc. OC192 LOS` alarm for Main slot **M2**.

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the VLF OC-192 OLIU circuit pack in Main slot **M2**.

If the local operating procedures specify…	Then…
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 6.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 3.

3 **Important!** This step is optional. If the VLF OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the VLF OC-192 OLIU circuit pack in Main slot **M2**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

4 **Important!** This step is optional. If the VLF OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the VLF OC-192 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

5 If required, repeat Step 3 to verify that the circuit pack in Main slot **M1** is now the active circuit pack for timing.

6 Open the lower faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M2**.

If Main slot M2 was originally equipped with...	Then replace the VLF OC-192 OLIU circuit pack in Main slot M2 with...
LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), or LNW221–259 (pre Series 1:6) OC-48 OLIUs,	the temporary replacement non-VLF OC-48 OLIU circuit pack.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIUs,	the original non-VLF OC-48 OLIU circuit pack

Result: The system reports an `unexpected circuit pack type` *alarm* for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

7 At both ends of the optical span, perform the following to connect the non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span.

9 Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the temporary replacement non-VLF OC-192 OLIU circuit pack.

Result: The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and an `unexpected CP type` *condition* for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement non-VLF OC-192 in Main slot **M1** with the VLF OC-192 OLIU circuit pack. Refer to Procedure 12-19: "Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR" (p. 12-395).

To back out the upgrade, refer to Procedure 12-20: "Back out non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade" (p. 12-423).

11 **Important!** Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack.

If an `unexpected CP type` *alarm* is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, proceed to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* for Main slot **M1** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M2**.

12 Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement non-VLF OC-48 OLIU circuit pack.

Result: The system still reports an `unexpected CP type` *alarm* for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

13 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

14 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the OC-48 optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span.

15 Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the temporary replacement non-VLF OC-192 OLIU circuit pack..

Result: The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and an `unexpected CP type` *condition* for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

16 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement non-VLF OC-192 in Main slot **M1** with the VLF OC-192 OLIU circuit pack. Refer to Procedure 12-19: "Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR" (p. 12-395).

To back out the upgrade, refer to Procedure 12-20: "Back out non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade" (p. 12-423).

17 **Important!** Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack.

If an `unexpected circuit pack type` *alarm* is reported for Main slot **M2**, select **Configuration** → **Update System** → **Upgrade**, then select **main-2** as the Directed Slot Choice and click **OK**. Otherwise, proceed to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span.

18 Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the temporary replacement non-VLF OC-192 OLIU circuit pack..

Result: The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and an `unexpected CP type` *condition* for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

19 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

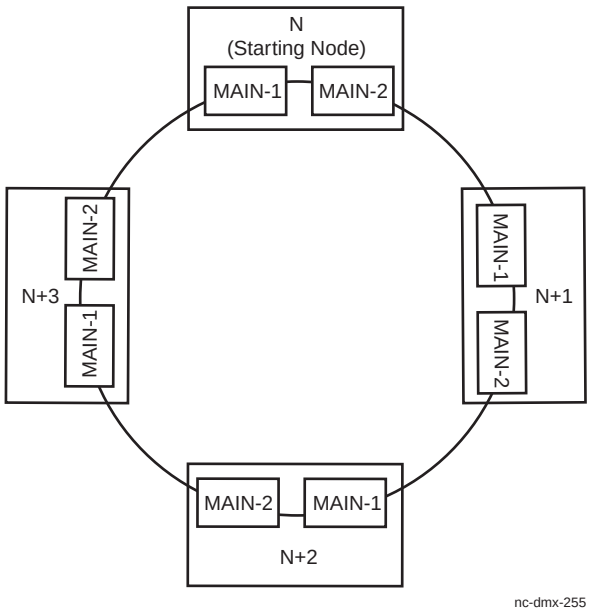
STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement non-VLF OC-192 in Main slot **M1** with the VLF OC-192 OLIU circuit pack. Refer to Procedure 12-19: "Upgrade non-VLF OC-48 UPSR to VLF OC-192 UPSR" (p. 12-395).

To back out the upgrade, refer to Procedure 12-20: "Back out non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade" (p. 12-423).

END OF STEPS

UPSR example



Procedure 12-22: Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR

Overview

Important! The BLSR must be equipped with Alcatel-Lucent 1665 DMX nodes only. This upgrade procedure does *not* support upgrading BLSRs equipped with nodes other than Alcatel-Lucent 1665 DMX.

Use this procedure to upgrade an in-service non-Very Large Fabric (VLF) OC-48 BLSR to a VLF OC-192 BLSR. To upgrade an in-service non-VLF OC-48 BLSR to a non-VLF OC-192 BLSR, refer to Procedure 12-11: "Upgrade OC-48 BLSR to OC-192 BLSR" (p. 12-236).

This procedure supports upgrading BLSR nodes equipped with non-VLF LNW27, LNW29, LNW32, LNW56, LNW57, LNW58, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit packs to VLF LNW59 or LNW504 OC-192 OLIU circuit packs.

Any BLSR nodes equipped with LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack must be upgraded to LNW27, LNW29, LNW32, LNW76, LNW202, and/or LNW221–259 OC-48 OLIU circuit pack before performing this procedure, refer to Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5).

The non-VLF OLIU circuit packs in the Main slots are upgraded at each node. Low-speed OC-48 BLSR upgrades are not supported in this release.

This procedure assumes that in the BLSR, the circuit pack in Main slot **M1** is always connected to the circuit pack in Main slot **M2** of the adjacent node. (Refer to the "BLSR example" (p. 12-462) at the end of the procedure.)

Important! The Very Large Fabric circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The Standard Alcatel-Lucent 1665 DMX Shelf does not support upgrades to Very Large Fabric circuit packs.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Important! Systems equipped with VLF mains (LNW82, LNW59, LNW504) support extra traffic on all OC-192 BLSRs (Main and Function). Systems equipped with non-VLF OC-48 mains support extra traffic on the main OC-48 BLSRs only. Regardless of equipage combinations, extra traffic is not supported on any other BLSR.

Ring Upgrade Mode

During the upgrade, each node in the ring must be provisioned in the Ring Upgrade Mode. The Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack and prohibits the following operations:

- Software upgrades to the node (**`APPLY`**, **`INS-PRGM`**)
- Cross-connection provisioning (**`ENT-CRS`**, **`DLT-CRS`**)
- Manual equipment protection switching of the Function/Growth slots (**`SW-TOPROTN`**, **`SW-TOWKG`**)

While the node is in the Ring Upgrade Mode, the BLSR protection group Wait to Restore timer is automatically provisioned *0*. The Wait to Restore timer returns to the original provisioned value when the node leaves the Ring Upgrade Mode.

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded ring, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Upgrades to multiport circuit packs

When upgrading to a circuit pack with more ports, the cross-connections on the original port are mapped to the same port number on the upgrade circuit pack. The upgrade circuit pack must also be configured with compatible pluggable transmission modules. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics.

The additional ports on the upgrade circuit pack cannot be used until after the upgrade is completed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, “System configuration procedures”.

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- The following lightguide buildouts (LBOs) should be available:
  - 5-dB loss LBO (code ABLCS-05.0: comcode 108279381)
  - 10-dB loss LBO (code ABLCS-10.0: comcode 108279431)
  - 15-dB loss LBO (code ABLCS-15.0: comcode 108279480)
- Lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269)
- As optical spans are upgraded around the BLSR, ensure that technicians are available at each end of an optical span as it is upgraded.

- If Main slot **M1** at the first node to be upgraded is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack, *one* Series 1:6 or later version of the same OC-48 OLIU circuit pack type, is temporarily required. You must upgrade Main-1 in the Starting Node and all Main-2 circuit packs in the remaining nodes to compatible Mains before upgrading the ring to OC-192. For example if the first node to be upgraded is equipped with pre Series 1:6 LNW27 OC-48 OLIU circuit packs, then a Series 1:6 or later LNW27 OC-48 OLIU circuit pack is temporarily required.
- One temporary replacement non-VLF LNW56 OC-192 OLIU circuit pack is required for Main slot **M2** at the first node to be upgraded. The temporary replacement non-VLF LNW56 OC-192 OLIU circuit pack is intended for use only as the temporary transition circuit pack during ring upgrades.

  A non-VLF LNW57, LNW58, LNW502, or LNW555 OC-192 OLIU circuit pack may also be used as the temporary replacement non-VLF OC-192 OLIU circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.
- Two replacement VLF LNW59 OC-192 OLIU circuit packs for each node.

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.
- Two replacement VLF LNW504 OC-192 OLIU circuit packs for each node.

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.

  Important! Release 7.1.1 or later software is required to support upgrades to VLF LNW59 OC-192 OLIU circuit packs.

  Release 9.1 or later software is required to support upgrades to VLF LNW504 OC-192 OLIU circuit packs.

  Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

Transmission hits (up to 130 ms) will occur as BLSR traffic is switched.

Transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the BLSR and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-192 OLIU circuit packs. Ensure that the OC-192 OLIU circuit packs are compatible with each fiber span in the BLSR. Attenuation and Dispersion may be limiting factors at longer span lengths.

4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.
5. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to upgrade an in-service non-VLF OC-48 BLSR to a VLF OC-192 BLSR.

1 From office records and work instructions, determine the current network configuration.

2 Log in to a node in the BLSR to be upgraded.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

3 Select **View** → **Rings** → **Ring Map**. Click on required Ring ID and **Select**. Click **View Graphic** and observe the ring map diagram. Note how the nodes are connected in the ring and make a drawing of the ring map diagram to reference during this upgrade procedure.

4 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

5 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

6 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

7 **Important!** The system does *not* support upgrades from a non-VLF OC-48 BLSR main with extra traffic to a VLF OC-192 BLSR. If OC-48 BLSR extra traffic cross-connections exist at a node, attempts to upgrade the pack will be denied.

Important!

Select **View** → **Cross-Connections** to access the required circuit packs and obtain a current list of cross-connections. If required, select **Configuration** → **Cross-Connections**to access the *Cross-Connection Wizard* and delete/change the existing OC-48 BLSR extra traffic cross-connections.

8 **Important!** Nodes must be equipped with LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs in the Main slots. Upgrades from LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit packs directly to VLF OC-192 OLIU circuit packs are not supported.

Select **Reports** → **Equipment Lists**→ **Pack**. Click **Shelf** and **Select** to access the *Circuit Pack List* and verify that the shelf is not equipped with LNW26B, LNW28, LNW77, or LNW121B–159B OC-48 OLIUs.

If required, upgrade the node with LNW27, LNW29, LNW32, LNW76, LNW202, or LNW221–259 OC-48 OLIU circuit packs.

Reference: Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5)

9 **Important!** If the node is equipped with LNW6 or LNW7 28DS1 circuit packs, attempts to upgrade from non-VLF OLIU circuit packs to VLF OLIU circuit packs are denied.

Select **Reports** → **Equipment Lists**→ **Pack**. Click **Shelf** and **Select** to access the *Circuit Pack List* and verify that the shelf is not equipped with LNW6 or LNW7 28DS1 circuit packs.

If required, replace the LNW6 or LNW7 28DS1 circuit packs.

Reference: Procedure 12-15: "Upgrade low-speed electrical circuit packs" (p. 12-317)

10 **Important!** Before upgrading the BLSR, Automatic Ring Discovery must be disabled.

Select **View** → **Protection** to access the *2F BLSR main-1-1* protection group and click **Select**. Click on the Provisionable Parameters tab and observe the *Automatic Ring Discovery* parameter.

If required, select **Configuration** → **Equipment** to access the *2F BLSR main-1-1* protection group and Disable Automatic Ring Discovery.

Important! If necessary, record the original parameter value to be reprovisioned after the upgrade is completed.

11 At each of the remaining nodes in the BLSR, log in to the node and repeat Step 3 through Step 10. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

12



NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-22.4: "Verify spanning tree configuration" (p. 12-471)

13 Identify and log in to the starting node. (Refer to the "BLSR example" (p. 12-462) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

14 Determine the OC-48 OLIU circuit pack types installed in the Main slots of the starting node using **Reports** → **Equipment Lists** → **Packs**. Click *Shelf* and **Select**. Observe the *Apparatus Code* and *Series Number* of the *main-1* and *main-2* circuit packs. Click **Close**.

15 **Important!** If Main slot **M1** of the starting node is equipped with a pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack, the circuit pack *must* be replaced with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type. The Series 1:6 or later OC-48 OLIU circuit pack maintains traffic while Main slot **M2** and the other nodes in the ring are upgraded. As a final step, the Series 1:6 or later OC-48 OLIU circuit pack is upgraded.

If required, replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Reference: Procedure 12-22.1: "Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node" (p. 12-463)

16 If required, verify the active/standby status of the non-VLF OC-48 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-22.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-465)

17 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View at the starting node, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-448).

18 

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Important! The non-VLF OC-48 OLIU circuit pack in Main slot **M2** *must* be replaced with a temporary replacement non-VLF OC-192 OLIU circuit pack. (Refer to "Required equipment" (p. 12-449) for a list of acceptable temporary replacement non-VLF OC-192 OLIU circuit packs.) The temporary replacement non-VLF OC-192 OLIU circuit pack maintains traffic while Main slot **M1** and the other nodes in the ring are upgraded. As a final step, this temporary replacement non-VLF OC-192 OLIU circuit pack is upgraded

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement non-VLF OC-192 OLIU circuit pack.

Result: A transmission hit will occur after the OC-192 OLIU circuit pack is inserted. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

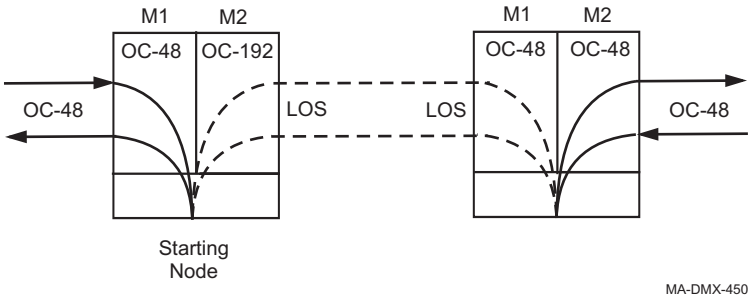
The system reports an `unexpected circuit pack type` *condition* and an `OC48 LOS` alarm for Main slot **M2**. The system also reports a `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

This completes the first phase of the BLSR upgrade at the starting node. The starting node upgrade will be completed after all the other nodes in the ring are upgraded.

The following figure shows the state of the starting node and the adjacent optical spans.



19 Log in to the adjacent node connected to Main slot **M2**. (Refer to the "BLSR example" (p. 12-462) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

20 Upgrade the high-speed non-VLF OC-48 BLSR connections at the node to VLF OC-192 UPSR connections.

Reference: Procedure 12-22.3: "Upgrade high-speed BLSR connections at node using VLF OC-192 OLIU circuit packs" (p. 12-467)

21 Except for the starting node, have all nodes in the BLSR been upgraded?

If...	Then...
No	Repeat Step 19 through Step 20 as required at the next node. (Refer to the "BLSR example" (p. 12-462) at the end of the procedure.)

If...	Then...
Yes	Continue with Step 22.

22 Log in to the starting node. (Refer to the "BLSR example" (p. 12-462) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

23 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` *condition* for Main slot **M1**.

24 If required, verify the active/standby status of the non-VLF OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-22.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-465)

25 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M1** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected circuit pack type` *alarm* for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

26 At both ends of the optical span to be upgraded, perform the following to connect the replacement VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the upgraded OC-192 optical span, the `inc. OC192 LOS` alarm clears and the system reports a `Default K-bytes` alarm.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

27



NOTICE

Service-disruption hazard

Transmission hits (up to 130 ms) will occur as BLSR traffic is switched.

Transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system performs an automatic protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 130 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the upgraded OC-192 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the upgraded optical span between Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span.

28 Open the lower faceplate latch on the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the temporary replacement non-VLF OC-192 OLIU circuit pack circuit pack in Main slot **M2**. Then replace the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

29 At both ends of the optical span to be upgraded, perform the following to connect the replacement VLF OC-192 OLIU circuit pack in Main slot **M2** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC192 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

30 **Important!** At each node in the BLSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the BLSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

31 **Important!** The network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node cannot be returned to the pre-upgrade state using the backout procedure.

At each node in the BLSR, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

32 At each node in the BLSR, select **View** → **Protection** to access the *2F BLSR main-1-1* protection group and click **Select**. Click on the Provisionable Parameters tab and observe the *Automatic Ring Discovery* parameter.

If required, select **Configuration** → **Equipment** to access the *2F BLSR main-1-1* protection group and Enable Automatic Ring Discovery.

33 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup

copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the BLSR, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)

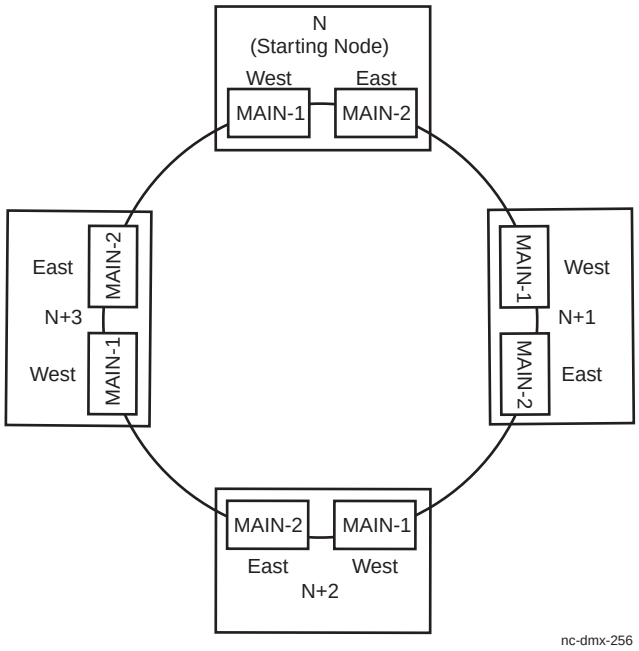
END OF STEPS

BLSR example

Starting Node: Alcatel-Lucent 1665 DMX Node N

Starting Circuit Pack: Main-2 at the Starting Node

Direction of Upgrade: Clockwise around BLSR from Main-2 at the Starting Node to Main-1 at the adjacent node.



Procedure 12-22.1: Replace pre Series 1:6 LNW27, 29, 76, 221–259 OC-48 OLIU in Main slot M1 of starting node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to replace the pre series 1:6 LNW27, LNW29, LNW76, or LNW221–259 OC-48 OLIU circuit pack in Main slot **M1** of the starting node with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

1 If required, verify the active/standby status of the OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-22.2: “Verify active/standby status of circuit pack to be replaced” (p. 12-465)

2 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the pre Series 1:6 LNW27, 29, 76, or 221–259 OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with a Series 1:6 or later version of the same OC-48 OLIU circuit pack type.

Result: The Series 1:6 or later version OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `inc. OC48 LOS` alarm and `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

3 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

4 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms and `Line Automatic Switch` conditions clear. Transmission is now supported on the optical span.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-22.2: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

From the System View select **Reports** → **Status Lists** → **Pack**. Click *Shelf* and **Select**. Observe the value of the *Switch State* parameter to determine if the circuit pack to be replaced is active for transmission. Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, an optional manual switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 6.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Click on *2F BLSR main-1-1* and **Select**. Select the required Direction for the circuit pack to be replaced (*West* for slot **M1** or *East* for slot **M2**) and *Manual to Protection, Ring* Switch Type, and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and **Close**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the Alarm List shows the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-22.3: Upgrade high-speed BLSR connections at node using VLF OC-192 OLIU circuit packs

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to upgrade the in-service high-speed non-VLF OC-48 BLSR connections at a node using VLF OC-192 OLIU circuit packs.

1 If required, verify the active/standby status of the non-VLF OC-48 OLIU circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-22.2: “Verify active/standby status of circuit pack to be replaced” (p. 12-465)

2 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to “Ring Upgrade Mode” (p. 12-448).

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M1**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M1** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected circuit pack type` *alarm* and a `Line Automatic Switch` condition for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

4 At both ends of the optical span to be upgraded, perform the following to connect the replacement VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the upgraded OC-192 optical span, the `inc. OC192 LOS` alarm clears and the system reports a `Default K-bytes` alarm.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 

NOTICE

Service-disruption hazard

Transmission hits (up to 130 ms) will occur as BLSR traffic is switched.

Transmission hits (up to 3 seconds) will occur as traffic on LNW20 TMUX circuit packs is switched.

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system performs an automatic protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 130 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the upgraded OC-192 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the upgraded optical span between Main slot **M1** and the required OC-192 circuit pack/port at the opposite end of the upgraded OC-192 optical span.

6

NOTICE

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

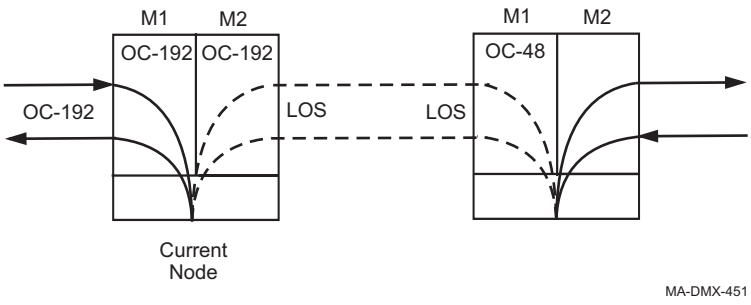
Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 OLIU circuit pack is upgraded at each end of the optical span.

Open a faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M2** with the replacement VLF OC-192 OLIU circuit pack.

Result: The system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement VLF OC-192 OLIU circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the `unexpected CP type` *alarm* for Main slot **M2** clears, and the system reports an `inc. OC192 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-22.4: Verify spanning tree configuration

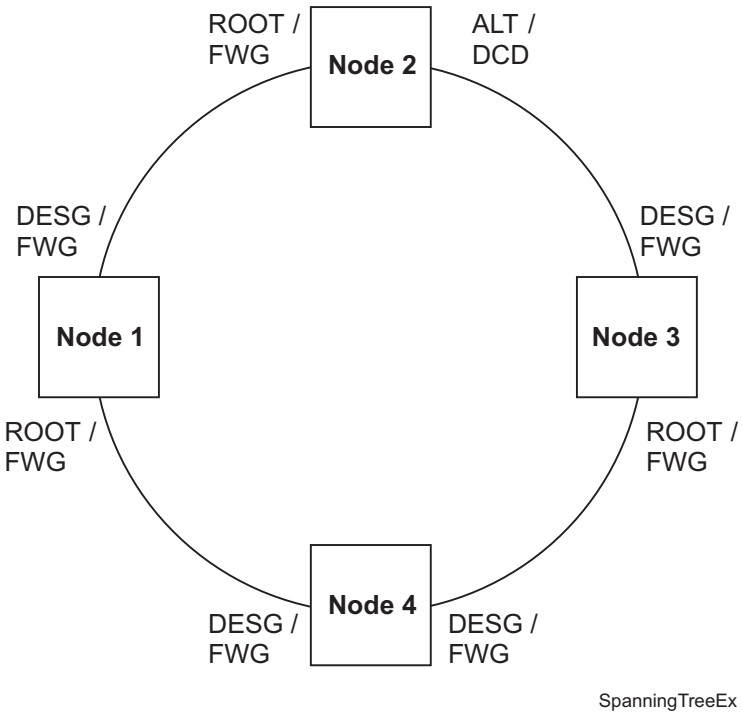
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-471).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

If required, change the existing spanning tree configuration.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-23: Back out non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out a non Very Large Fabric (VLF) OC-48 to VLF OC-192 BLSR upgrade.

Backing out of an upgrade in progress returns *all* nodes in the ring to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-24: “Suspend non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade” (p. 12-489).

Important! Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original non-VLF OC-48 OLIU circuit packs for each node to be backed out
- The temporary replacement non-VLF OC-192 OLIU circuit pack is required for Main slot **M2** of the starting node.
- As the upgrade is backed out around the BLSR, ensure that technicians are available at each end of an optical span as the upgrade is backed out.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.
3. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to back out an non-VLF OC-48 to VLF OC-192 BLSR upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node that was upgraded.

If the last node upgraded is...	Then log in to the...
the starting node, and the ring upgrade is complete (all nodes are in the Ring Upgrade Mode),	starting node (refer to the "BLSR example" (p. 12-483) at the end of the procedure) and continue with Step 3.
not the starting node,	last node upgraded (refer to the "BLSR example" (p. 12-483) at the end of the procedure) and proceed to Step 11.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 If required, verify the active/standby status of the VLF OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-23.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-487)

4 Using office records, determine the original/temporary replacement non-VLF OC-48 OLIU circuit pack types installed in the Main slots and the temporary replacement non-VLF OC-192 OLIU circuit pack installed in Main slot **M2**.

5 **Important!** The VLF OC-192 OLIU circuit pack in Main slot **M2** of the starting node must be replaced with the temporary replacement non-VLF OC-192 OLIU circuit pack. The temporary replacement non-VLF OC-192 OLIU circuit pack maintains traffic while the upgrade is backed out at Main slot **M1** and the other nodes in the ring. As a final step, this temporary replacement non-VLF OC-192 OLIU circuit pack is backed out.

Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M2**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M2** with the temporary replacement non-VLF OC-192 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M2**. Alarms may also be reported at other nodes in the ring.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

6 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 OLIU circuit packs.)

7 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**.

Result: At the opposite end of the OC-192 optical span, the `inc. OC192 LOS` alarm clears and the system reports a `Default K-bytes` alarm.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the OC-192 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the optical span between Main slot **M2** and the required OC-192 circuit pack/port at the opposite end of the OC-192 optical span.

9 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

Open the lower faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the required non-VLF OC-48 OLIU circuit pack (Series 1:6 or greater).

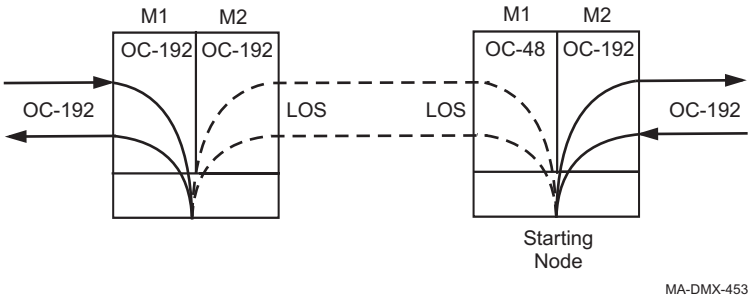
Result: The original non-VLF OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` *condition* and an `inc. OC192 LOS` alarm for Main slot **M1**. The system also reports a `Line Automatic Switch` condition for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

This completes the first phase of the back out at the starting node. The back out at the starting node will be completed after backing out of all the other nodes in the ring.

The following figure shows the state of the starting node and the adjacent optical spans.



10 Log in to the adjacent node connected to Main slot **M1**. (Refer to the "BLSR example" (p. 12-483) at the end of the procedure.)

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

11 Back out the high-speed VLF OC-192 BLSR upgrade connections at the node to the original non-VLF OC-48 BLSR connections.

Result: Procedure 12-23.1: "Back out high-speed non-VLF OC-48 to VLF OC-192 BLSR upgrade at node" (p. 12-484)

12 Except for the starting node, has the upgrade been backed out of all nodes in the BLSR?

If...	Then...
No,	Repeat Step 10 through Step 11 as required at the next node. (Refer to the "BLSR example" (p. 12-483) at the end of the procedure.)
Yes,	Continue with Step 13.

13 Log in to the starting node. Refer to the "BLSR example" (p. 12-483) at the end of the procedure.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

14 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` *condition* for Main slot **M1** clears. The system reports an `unexpected circuit pack type` *condition* for Main slot **M2**.

15 If required, verify the active/standby status of the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-23.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-487)

16 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2**. Then replace the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M2** with the original non-VLF OC-48 OLIU circuit pack.

Result: The `unexpected circuit pack type` *condition* for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

17 At both ends of the optical span to be backed out, perform the following to connect the original non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the original OC-48 optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

18 **Important!** At each node in the BLSR, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At each node in the BLSR, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

19 **Important!** This completes the backout procedure, except for taking the nodes out of the Ring Upgrade Mode and enabling Automatic Ring Discovery. The decision to take all nodes out of the Ring Upgrade Mode depends on the reason the back out was necessary, and what is required before again starting or completing the ring upgrade. All nodes must remain in the Ring Upgrade node until the ring upgrade is completed.

At each node in the BLSR as required, select **Configuration** → **Normal Mode** to take the node out of the Ring Upgrade Mode.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

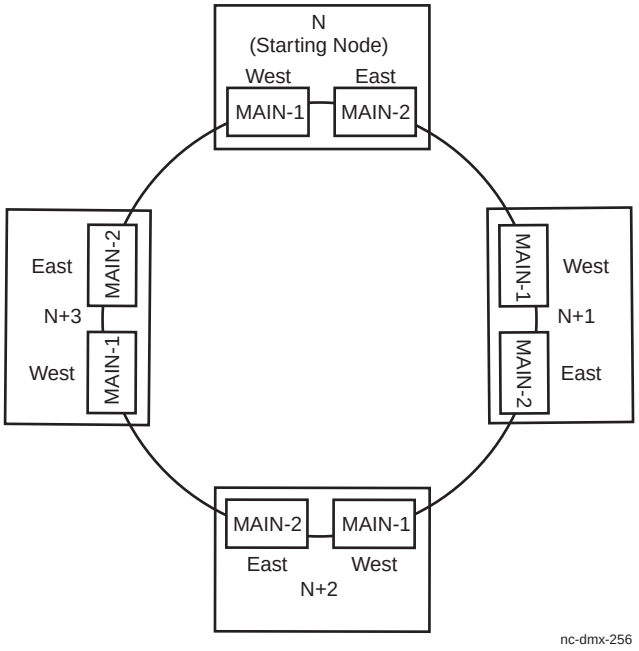
The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

20 At each node in the BLSR as required, select **View** → **Protection** to access the *2F BLSR main-1-1* protection group and click **Select**. Click on the Provisionable Parameters tab and observe the *Automatic Ring Discovery* parameter.

If required, select **Configuration** → **Equipment** to access the *2F BLSR main-1-1* protection group and Enable Automatic Ring Discovery.

END OF STEPS

BLSR example



Procedure 12-23.1: Back out high-speed non-VLF OC-48 to VLF OC-192 BLSR upgrade at node

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to back out a non-VLF OC-48 UPSR to VLF OC-192 UPSR upgrade at a node.

1 Determine the current status of the upgrade at the node.

If...	Then...
both Main slots have been upgraded with VLF OC-192 OLIU circuit packs,	Continue with Step 2.
only Main slot **M1** has been upgraded with a VLF OC-192 OLIU circuit pack,	Proceed to Step 5.

2 If required, verify the active/standby status of the VLF OC-192 OLIU circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

Reference: Procedure 12-23.2: "Verify active/standby status of circuit pack to be replaced" (p. 12-487)

3 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Open the lower faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M2**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M2** with the original non-VLF OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)`, `section DCC channel failed`, and `Default K-bytes` alarms.

If the provisioned system timing mode is External, the system may also report an `inc. DS1 sync. ref. OOL` alarm.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

4 At both ends of the optical span to be backed out, perform the following to connect the original non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears and the system reports a `Default K-bytes` alarm.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

5 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the original OC-48 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the original optical span between Main slot **M2** and the required OC-48 circuit pack/port at the opposite end of the original OC-48 optical span.

6 **NOTICE**

Equipment damage hazard

If an OC-192 OLIU circuit pack is connected to an OC-48 OLIU circuit pack equipment damage may occur.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-192 OLIU circuit pack is backed out at each end of the optical span.

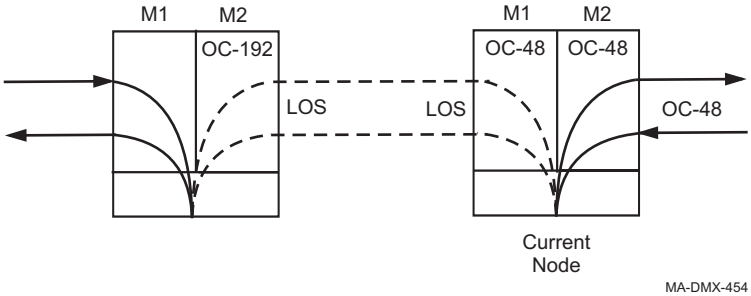
Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the original non-VLF OC-48 OLIU circuit pack.

Result: The original non-VLF OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and a `Line Automatic Switch` condition for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

The following figure shows the state of the current node and the adjacent optical spans.



STOP! *To complete backing out the BLSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-23.2: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

From the System View select **Reports** → **Status Lists** → **Pack**. Click *Shelf* and **Select**. Observe the value of the *Switch State* parameter to determine if the circuit pack to be replaced is active for transmission. Click **Close**.

5 **Important!** If the circuit pack to be replaced is an active circuit pack for transmission, an optional manual switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for transmission, proceed to Step 6 .

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Click on *2F BLSR main-1-1* and **Select**. Select the required Direction for the circuit pack to be replaced (*West* for slot **M1** or *East* for slot **M2**) and *Manual to Protection, Ring* Switch Type, and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and **Close**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the Alarm List shows the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete backing out the BLSR upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-24: Suspend non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes in the ring must be in the provisioned Ring Upgrade Mode.

Use this procedure to temporarily suspend a non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade.

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the ring to their pre-upgrade state, refer to Procedure 12-23: “Back out non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade” (p. 12-475).

When the ring upgrade is temporarily suspended before completion, some spans are operating at the OC-48 line rate and some at the OC-192 line rate. This requires two nodes that are equipped with an OC-48 OLIU circuit pack in one Main slot and an OC-192 OLIU circuit pack in the other Main slot. These nodes are the starting node and the last node upgraded.

To continue to operate temporarily with different circuit packs in the Main slots, the starting node and the nodes that have been upgraded must remain in the Ring Upgrade Mode.

> **Important!** Transmission hits will occur during this procedure whenever an OLIU circuit pack with a different line rate is installed or removed from a Main slot. The transmission hit is a result of an internal system timing adjustment to accommodate different line rates in the two Main slots.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- One original or temporary replacement LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack is required for Main slot **M2**.
- One temporary replacement non-VLF LNW56, LNW57, LNW58, LNW502, or LNW555 OC-192 OLIU circuit pack is required for Main slot **M1**.

The temporary replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 and OC-192 OLIU circuit packs.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this suspend procedure.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected during this procedure, `Default K-bytes` alarms are reported temporarily.

Complete the following steps to temporarily suspend a non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade.

1 Identify the last node that was upgraded.

If...	Then...
both Main slots have been upgraded,	Log in to the last node upgraded (refer to the "BLSR example" (p. 12-500) at the end of the procedure) and continue with Step 2.
Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), and/or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack	Log in to the last node upgraded (refer to the "BLSR example" (p. 12-500) at the end of the procedure) and proceed to Step 11.
Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, and/or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack	Log in to the last node upgraded (refer to the "BLSR example" (p. 12-500) at the end of the procedure) and proceed to Step 17.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 **Important!** Both Main slots have been upgraded. All traffic is now active on Main slot **M1**. The system is reporting an `inc. OC192 LOS` alarm and a `Line Automatic Switch` condition for Main slot **M2**.

and the

Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the VLF OC-192 OLIU circuit pack in Main slot **M2**.

If the local operating procedures specify...	Then...
disconnect the optical fibers and remove the circuit pack,	Proceed to Step 6.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack,	Continue with Step 3.

3 **Important!** This step is optional. If the VLF OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the VLF OC-192 OLIU circuit pack in Main slot **M2**.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

4 **Important!** This step is optional. If the VLF OC-192 OLIU circuit pack in Main slot **M2** is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack in Main slot **M2**. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the VLF OC-192 OLIU circuit pack in Main slot **M1** is the active circuit pack for timing, do *not* perform this step.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

5 If required, repeat Step 3 to verify that the circuit pack in Main slot **M1** is now the active circuit pack for timing.

6 Open the lower faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M2**.

If Main slot M2 was originally equipped with...	Then replace the VLF OC-192 OLIU circuit pack in Main slot M2 with...
LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), or LNW221–259 (pre Series 1:6) OC-48 OLIUs,	the temporary replacement non-VLF OC-48 OLIU circuit pack.
LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIUs,	the original non-VLF OC-48 OLIU circuit pack

Result: The system also reports an `unexpected circuit pack type` *alarm* and a `Line Automatic Switch` condition for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

7 At both ends of the optical span, perform the following to connect the non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

8 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clears, and the system reports an `unexpected CP type` *alarm* and a `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

Transmission is now supported on the optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span.

9 Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the temporary replacement non-VLF OC-192 OLIU circuit pack.

Result: The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and an `unexpected CP type` *condition* for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

10 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

   STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

   To resume the upgrade, replace the temporary replacement non-VLF OC-192 in Main slot **M1** with the VLF OC-192 OLIU circuit pack. Refer to Procedure 12-22: "Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR" (p. 12-447).

   To back out the upgrade, refer to Procedure 12-23: "Back out non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade" (p. 12-475).

11 **Important!** Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (pre Series 1:6), LNW29 (pre Series 1:6), LNW76 (pre Series 1:6), or LNW221–259 (pre Series 1:6) OC-48 OLIU circuit pack.

If an `unexpected CP type` *alarm* is reported for Main slot **M1**, select **Configuration** → **Update System** → **Upgrade**, then select **main-1** (default) as the Directed Slot Choice and click **OK**. Otherwise, proceed to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M1**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1** clear, and the system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2**.

12 Open the lower faceplate latch on the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Disconnect the optical fibers from the non-VLF OC-48 OLIU circuit pack in Main slot **M2**. Then replace the non-VLF OC-48 OLIU circuit pack in Main slot **M2** with the temporary replacement non-VLF OC-48 OLIU circuit pack.

Result: The system still reports an `unexpected CP type` *alarm* for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

13 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-48 OLIU circuit pack in Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the original OC-48 optical span, the `inc. OC48 LOS` alarm clears.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

14 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the OC-48 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the OC-48 optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span.

15 Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the temporary replacement non-VLF OC-192 OLIU circuit pack..

Result: The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and an `unexpected CP type` *condition* for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

16 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the optical span.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

To resume the upgrade, replace the temporary replacement non-VLF OC-192 in Main slot **M1** with the VLF OC-192 OLIU circuit pack. Refer to Procedure 12-22: “Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR” (p. 12-447).

To back out the upgrade, refer to Procedure 12-23: "Back out non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade" (p. 12-475).

17 **Important!** Main slot **M1** has been upgraded and Main slot **M2** is equipped with an LNW27 (Series 1:6 and later), LNW29 (Series 1:6 and later), LNW32, LNW76 (Series 1:6 and later), LNW202, or LNW221–259 (Series 1:6 and later) OC-48 OLIU circuit pack.

If an `unexpected circuit pack type` *alarm* is reported for Main slot **M2**, select **Configuration** → **Update System** → **Upgrade**, then select **main-2** as the Directed Slot Choice and click **OK**. Otherwise, proceed to the next step.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The non-VLF OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic line protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M2** clear. The system reports an `unexpected CP type` *alarm* and `Line Automatic Switch` condition for Main slot **M1**. Alarms may also be reported at other nodes in the ring.

At the opposite end of the OC-48 optical span, the `Default K-bytes` alarm clears. Transmission is now supported on the OC-48 optical span between Main slot **M2** and the required non-VLF OC-48 circuit pack/port at the opposite end of the original OC-48 optical span.

18 Open a faceplate latch on the VLF OC-192 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the VLF OC-192 OLIU circuit pack in Main slot **M1**. Then replace the VLF OC-192 OLIU circuit pack in Main slot **M1** with the temporary replacement non-VLF OC-192 OLIU circuit pack..

Result: The temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` *alarm* for Main slot **M1** clears. The system reports an `inc. OC48 LOS` alarm and an `unexpected CP type` *condition* for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

19 At both ends of the optical span, perform the following to connect the temporary replacement non-VLF OC-192 OLIU circuit pack in Main slot **M1** and the required VLF OC-192 circuit pack/port at the opposite end of the OC-192 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-192 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC48 LOS` alarm clears. Transmission is now supported on the optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

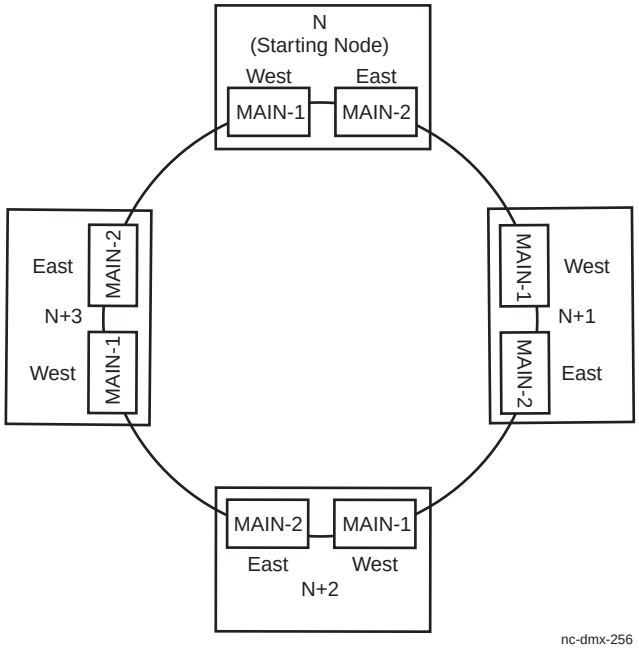
   STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

   To resume the upgrade, replace the temporary replacement non-VLF OC-192 in Main slot **M1** with the VLF OC-192 OLIU circuit pack. Refer to Procedure 12-22: "Upgrade non-VLF OC-48 BLSR to VLF OC-192 BLSR" (p. 12-447).

   To back out the upgrade, refer to Procedure 12-23: "Back out non-VLF OC-48 BLSR to VLF OC-192 BLSR upgrade" (p. 12-475).

END OF STEPS

BLSR example



Procedure 12-25: Upgrade LNW70 100/1G FXS circuit pack

Overview

Use this procedure to upgrade an unprotected LNW70 100/1G FXS circuit pack to an LNW170 100/1G FXS circuit pack in the same slot.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Replacement LNW170 100/1G FXS circuit pack
- Preloaded software on the replacement LNW170 100/1G FXS circuit pack (optional)

The pluggable transmission modules installed in the LNW70 circuit pack are reused in the replacement LNW170 circuit pack.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

This is a service-affecting upgrade. If the unprotected LNW70 circuit pack is in service, a service outage will occur when the fibers, pluggable transmission modules, or LNW70 circuit pack are removed from the shelf.

The length of the service outage is minimized if the required software is preloaded on the replacement LNW170 circuit pack.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure and verify that the affected circuit pack is specified.
3. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.

Steps

Complete the following steps to upgrade an unprotected LNW70 100/1G FXS circuit pack to an LNW170 100/1G FXS circuit pack in the same slot.

1 Log in to the node where the unprotected LNW70 100/1G FXS circuit pack is to be replaced.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 **Important!** To minimize the length of the service outage when the replacement LNW170 circuit pack is installed, it is recommended that the required software be preloaded on the replacement LNW170 circuit pack (optional).

If preloading the software on the replacement LNW170 circuit pack is...	Then...
required,	Continue with the next step.
not required,	Proceed to Step 7.

4 Install the replacement LNW170 circuit pack in an empty Function/Growth slot in the shelf or in another shelf running the same software version.

Result: If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement LNW170 circuit pack is installed. The circuit pack firmware update and initialization takes approximately 5-8 minutes.

If a circuit pack firmware update is not required, the circuit pack is initialized. The circuit pack initialization takes approximately 90 seconds.

Reference: Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)

5 When the circuit pack firmware update and initialization is complete, open the faceplate latches on the replacement LNW170 circuit pack and remove the circuit pack from the shelf.

Result: The system reports a `CP removed` alarm.

6 At the System View select **Configuration** → **Update System** → **Update All**.

Result: The `CP removed` alarm clears.

7 

NOTICE

Service-disruption hazard

A service outage will occur when the fibers, pluggable transmission modules, or LNW70 circuit pack are removed from the shelf until the replacement LNW170 circuit pack and pluggable transmission modules are installed with fibers reconnected.

The length of the service outage is minimized if the replacement LNW170 circuit pack is preloaded with the required software and the pluggable transmission modules/fibers are disconnected/moved from the LNW70 circuit pack to the replacement LNW170 circuit pack while the replacement LNW170 circuit pack is downloading software (if needed) and initializing.

Open the faceplate latches on the LNW70 circuit pack. If possible, remove the LNW70 circuit pack without disconnecting the pluggable transmission modules and fibers. If necessary, only remove the pluggable transmission modules and fibers required to remove the LNW70 circuit pack.

Result: The system reports a `CP removed` alarm.

8 Install the replacement LNW170 circuit pack. While the replacement LNW170 is downloading software (if needed) and initializing, disconnect the pluggable transmission modules/fibers from the LNW70 circuit pack and clean/connect to the replacement LNW170 circuit pack.

Result: If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` conditions when the replacement LNW170 circuit pack is installed. The circuit pack firmware update and initialization takes approximately 5-8 minutes. After the circuit pack firmware update and initialization is complete, the replacement LNW170 circuit pack/pluggable transmission modules are autoprovisioned and the system reports an `unexpected CP type` alarm.

If a circuit pack firmware update is not required, the circuit pack is initialized. The circuit pack initialization takes approximately 90 seconds. After the circuit pack initialization is complete, the replacement LNW170 circuit pack/pluggable transmission modules are autoprovisioned and the system reports an `unexpected CP type` alarm.

Transmission is now supported on the replacement LNW170 circuit pack.

Reference:

- Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)
- Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

9 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the System View select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement LNW170 circuit pack/pluggable transmission modules are tested and the `unexpected CP type` alarm clears.

10 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)

11 This completes the circuit pack upgrade. If required, repeat this procedure to upgrade another LNW70 circuit pack.

END OF STEPS

Procedure 12-26: Back out LNW70 100/1G FXS circuit pack upgrade

Overview



NOTICE

Service-disruption hazard

If **Configuration → Update System → Update All** *has been performed the node cannot be returned to the original pre-upgrade state.*

Do not use this procedure to downgrade an LNW170 100/1G FXS circuit pack to an LNW70 100/1G FXS circuit pack if the upgrade has been completed. The system does not support downgrading an LNW170 circuit pack to an LNW70 circuit pack.

Use this procedure to back out of an LNW70 100/1G FXS circuit pack to LNW170 100/1G FXS circuit pack upgrade.

Backing out of an upgrade in progress returns the node to the pre-upgrade state.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Original LNW70 100/1G FXS circuit pack

The pluggable transmission modules installed in the LNW170 circuit pack are reused in the original LNW70 circuit pack.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

If the unprotected LNW170 circuit pack is in service, a service outage will occur when the fibers, pluggable transmission modules, or LNW170 circuit pack are removed from the shelf.

This is a service-affecting procedure.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.

Steps

Important! The original LNW70 circuit pack has been replaced with the replacement LNW170 circuit pack and the system is reporting a `unexpected CP type` alarm.

Complete the following steps to back out of an LNW70 100/1G FXS circuit pack to LNW170 100/1G FXS circuit pack upgrade.

1



NOTICE

Service-disruption hazard

A service outage will occur when the fibers, pluggable transmission modules, or LNW170 circuit pack are removed from the shelf until the original LNW70 circuit pack and pluggable transmission modules are installed with fibers reconnected.

The length of the service outage is minimized if the pluggable transmission modules/fibers are disconnected/moved from the replacement LNW170 circuit pack to the original LNW70 circuit pack while the original LNW70 circuit pack is initializing.

Open the faceplate latches on the replacement LNW170 circuit pack. If possible, remove the replacement LNW170 circuit pack without disconnecting the pluggable transmission modules and fibers. If necessary, only remove the pluggable transmission modules and fibers required to remove the replacement LNW170 circuit pack.

Result: The system reports a `CP removed` alarm.

2 Install the original LNW70 circuit pack. While the original LNW70 is initializing, disconnect the pluggable transmission modules/fibers from the replacement LNW170 circuit pack and clean/connect to the original LNW70 circuit pack.

Result: The circuit pack initialization takes approximately 90 seconds. After the circuit pack initialization is complete, the original LNW70 circuit pack/pluggable transmission modules are autoprovisioned.

All alarms are cleared and service is restored on the original LNW70 circuit pack.

Reference:

- Procedure 4-13: “Install Gigabit Ethernet circuit packs” (p. 4-66)
- Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)
- Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! End of Procedure. This completes the backout procedure at the local node.

END OF STEPS

Procedure 12-27: Upgrade protected OC-n span to DWDM OTS span

Overview

Use this procedure to upgrade an in-service OC-n span to a DWDM OTS span in a 1+1/UPSR/BLSR network.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- One OMD circuit pack with an available Optical Channel (OCH) port at each end of the OC-n span to be upgraded. An empty Function/Growth slot is required at each node. For equipage guidelines and restrictions, refer to Procedure 4-25: “Install DWDM optical multiplexer/demultiplexer circuit packs” (p. 4-131).
- If the OC-n span to be upgraded is equipped with OC-192 OLIU circuit packs with pluggable transmission modules that do not match any available Optical Channel (OCH) ports on the OMD circuit pack, one DWDM pluggable transmission module that matches an available Optical Channel (OCH) port on the OMD circuit pack is required at each node.
- If the OC-n span to be upgraded is equipped with OC-3/OC-12/OC-48 OLIU circuit packs or multirate OLIU circuit packs equipped with OC-3, OC-12, or OC-48 pluggable transmission modules, an XM10G/8 Muxponder circuit pack with an available OC-n client port is required. The OTU2 port of XM10G/8 circuit pack must be equipped with a DWDM pluggable transmission module that matches an available Optical Channel (OCH) port on the OMD circuit pack. An empty Function/Growth slot is required at each node. For equipage guidelines and restrictions, refer to Procedure 4-28: “Install 10G Muxponder circuit packs” (p. 4-137).
- If the OC-n span to be upgraded is equipped with DWDM-incompatible OC-192 OLIU circuit packs, a node upgrade to a PTM-based, DWDM-compatible OC-192 OLIU circuit pack is required.

  Important! Release 7.1.1 or later software is required to support this upgrade.

DWDM-compatible circuit packs

The following circuit packs are DWDM compatible:

- LNW705 XM10G/8 Muxponder with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW57 OC-192 OLIU (channel 9550)
- LNW59 OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW60 OC-192 OLIU (channel 9550)
- LNW502 OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW504 OC-48/OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)
- LNW554 tunable OC-192 OLIU (channels 9520, 9530, 9540, 9550)
- LNW555 OC-192 OLIU (channel 9550)
- LNW603 OC-192 OLIU with DWDM-compatible pluggable transmission modules (channels 9520 - 9590)



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.

3. Verify that the work instructions specify the affected OC-n circuit pack/pluggable transmission module/port and protection group AIDs (if required).
4. Verify that the work instructions specify the circuit pack/pluggable transmission module/port parameters and values to be provisioned.
5. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this span upgrade procedure.
6. Determine the local operating procedures for removing optical fibers from an OC-n port. Local operating procedures may vary. One method is to disconnect the optical fibers. Another method is to verify the OC-n port active/standby status, perform manual switches if the OC-n port is active, and then disconnect the optical fibers.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected in a BLSR during this procedure, `Default K-bytes` alarms are reported temporarily.

Use this procedure to upgrade an in-service OC-n span to a DWDM OTS span.

1 From office records and work instructions, determine the current network configuration. Note how the nodes are connected and make a drawing to reference during this upgrade procedure.

2 Log in to a node that terminates the OC-n span to be upgraded.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

5 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

6 Using the work instructions, identify the OLIU circuit pack/pluggable transmission module (PTM)/port that terminates the OC-n span to be upgraded. Select **View** → **Equipment** to access the required OLIU circuit pack/pluggable transmission module/port. Record the OLIU circuit pack type, pluggable transmission module type, port rate, and frequency.

7 **Important!** If the OC-n span to be upgraded is terminated using DWDM-incompatible LNW56, LNW58, LNW523, or LNW527 OC-192 OLIU circuit packs, the node must be upgraded to LNW59 OC-192 OLIU circuit packs with DWDM-compatible pluggable transmission modules.

If required, upgrade the DWDM-incompatible LNW56, LNW58, LNW523, or LNW527 OC-192 OLIU circuit packs to LNW59 OC-192 OLIU circuit packs with DWDM-compatible pluggable transmission modules.

Reference: Procedure 12-1: "Upgrade cross-connect capacity/port density upgrade of high-speed OLIU circuit packs at a node" (p. 12-5)

8 At the opposite end of the OC-n span to be upgraded, log in to the node and repeat Step 3 through Step 7. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9

If the OC-n span to be upgraded is associated with...	Then upgrade the OC-n span using...
non-PTM-based, DWDM-compatible LNW57, LNW60, LNW554, or LNW555 OC-192 OLIU circuit packs,	Procedure 12-27.1: "Upgrade DWDM-compatible OC-192 span" (p. 12-515). Then continue with the next step.
PTM-based DWDM-compatible OC-192 OLIU circuit packs,	
OC-3/OC-12/OC-48 OLIU circuit packs	Procedure 12-27.2: "Upgrade DWDM-incompatible OC-3/12/48 span" (p. 12-517). Then continue with the next step.

10 At each node in the upgraded DWDM OTS span, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

11 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the upgraded DWDM OTS span, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

END OF STEPS

Procedure 12-27.1: Upgrade DWDM-compatible OC-192 span

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Complete the following steps to upgrade a DWDM-compatible OC-192 span to a DWDM OTS span.

1 **Important!** An OMD circuit pack with an available OCH port is required in a Function/Growth slot at each node that terminates the OC-n span to be upgraded.

If required, install an OMD circuit pack in a Function/Growth slot.

Reference: Procedure 4-25: “Install DWDM optical multiplexer/demultiplexer circuit packs” (p. 4-131)

2 If required, verify the active/standby status of the required OC-192 port and perform manual switches to switch traffic away from an active OC-192 port.

Reference: Procedure 12-27.3: “Verify active/standby status of OC-n port” (p. 12-520)

3 

NOTICE

Service-disruption hazard

Removing the wrong fiber connections will result in a service interruption.

Using the work instructions, ensure that you remove only the fiber connections for the optical span being upgraded.

Important! If the OC-192 port is active for transmission, disconnecting the optical fibers causes transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Disconnect the required OC-192 span fibers from the OLIU circuit pack/pluggable transmission module/port.

Result: Transmission hits (less than 60 ms) may occur if traffic exists on the OC-192 port. If through traffic exists (UPSRs and BLSRs only), transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped.

The system reports an `inc. OCN LOS` alarm for the OC-192 port when the OC-192 span fibers are disconnected.

For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for the OC-192 port.

Alarms may also be reported at other nodes in the network.

4 At the node at the opposite end of OC-192 span to be upgraded, repeat Step 1 through Step 3. Then continue with the next step.

5 If required, establish a DWDM point-to-point network using the span fibers to connect the OTS ports of the OMD circuit packs.

Reference: Procedure 9-12: "Establish DWDM network" (p. 9-142)

6 **Important!** The provisioned Expected Frequency of the OC-192 DWDM pluggable transmission module/port must match the OCH port frequency. If the provisioned Expected Frequency of the OC-192 DWDM pluggable transmission module/port and the OCH port frequency are different, attempts to provision an OCH cross-connection will be denied.

At the terminating nodes, install/provision the required OC-192 DWDM pluggable transmission module/port, and connect the OC-192 port to the required OCH port of the OMD circuit pack to add the OC-192 signal to the DWDM OTS span.

Result: The `inc. OCN LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 10-15: "Add optical channel (OCH) to DWDM network" (p. 10-92)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-27.2: Upgrade DWDM-incompatible OC-3/12/48 span

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Complete the following steps to upgrade a DWDM-incompatible OC-3/12/48 span to a DWDM OTS span.

1 **Important!** An OMD circuit pack with an available OCH port is required in a Function/Growth slot at each node that terminates the OC-3/12/48 span to be upgraded.

If required, install an OMD circuit pack in a Function/Growth slot.

Reference: Procedure 4-25: “Install DWDM optical multiplexer/demultiplexer circuit packs” (p. 4-131)

2 **Important!** An XM10G/8 circuit pack with an available client port is required in a Function/Growth slot at each node that terminates the OC-3/12/48 span to be upgraded.

If required, install an XM10G/8 circuit pack in a Function/Growth slot.

Reference: Procedure 4-28: “Install 10G Muxponder circuit packs” (p. 4-137)

3 If required, verify the active/standby status of the required OC-3/12/48 port and perform manual switches to switch traffic away from an active OC-3/12/48 port.

Reference: Procedure 12-27.3: “Verify active/standby status of OC-n port” (p. 12-520)

4 

NOTICE

Service-disruption hazard

Removing the wrong fiber connections will result in a service interruption.

Using the work instructions, ensure that you remove only the fiber connections for the optical span being upgraded.

Important! If the OC-3/12/48 port is active for transmission, disconnecting the optical fibers causes transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Disconnect the required OC-3/12/48 span fibers from the OLIU circuit pack/pluggable transmission module/port.

Result: Transmission hits (less than 60 ms) may occur if traffic exists on the OC-3/12/48 port. If through traffic exists (UPSRs and BLSRs only), transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped.

The system reports an `inc. OCN LOS` alarm for the OC-3/12/48 port when the OC-3/12/48 span fibers are disconnected.

For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for the OC-48 port.

Alarms may also be reported at other nodes in the network.

5 At the node at the opposite end of OC-3/12/48 span to be upgraded, repeat Step 1 through Step 4. Then continue with the next step.

6 If required, establish a DWDM point-to-point network using the span fibers to connect the OTS ports of the OMD circuit packs.

Reference: Procedure 9-12: “Establish DWDM network” (p. 9-142)

7 **Important!** The provisioned Expected Frequency of the OTU2 DWDM pluggable transmission module must match the OCH port frequency. If the provisioned Expected Frequency of the OTU2 DWDM pluggable transmission module and the OCH port frequency are different, attempts to provision an OCH cross-connection will be denied.

If required at the terminating nodes, install/provision the required OTU2 DWDM pluggable transmission module and connect the OTU2 port of the XM10G/8 circuit pack to the required OCH port of the OMD circuit pack to establish a DWDM OTU2 line.

Reference: Procedure 9-14: “Establish DWDM OTU2 line” (p. 9-177)

8 **Important!** The OLIU OC-n rate must match the XM10G/8 circuit pack OC-n client port rate.

At the terminating nodes, install/provision the required OC-n client port/pluggable transmission module and connect the OLIU OC-n port to the XM10G/8 circuit pack OC-n client port to add the OC-3/12/48 signal to the DWDM OTU2/OTS span.

Result: The `inc. OCN LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 10-17: “Add SONET/GbE/Data client signal” (p. 10-101)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-27.3: Verify active/standby status of OC-n port

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of an OC-n port and perform manual switches to switch traffic away from an active OC-n port.

1 **Important!** If the port is active for transmission and the optical fibers are disconnected, the system performs an automatic protection switches and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the OC-n port.

Select **View** → **Protection** to access the required protection groups (according to the work instructions) and determine the active lines/paths supported by the OC-n port. Record the active lines/paths supported by the OC-n port. Click **Close**.

2 **Important!** If the OC-n port is active for transmission, optional manual switches can be performed before disconnecting the optical fiber. In UPSRs, each path supported by the OC-n port must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-n port is *not* active for transmission, proceed to Step 3.

To perform an optional manual transmission switch traffic away from an active OC-n port, select **Fault** → **Protection Switch**.

If the required port is part of a ...	Then ...
UPSR protection group,	Expand *Path Protection*, select the required path and click **Select**. Select the *Manual* Switch Type and click **Apply**.
BSLR protection group,	Select the required *2F BLSR* line and click **Select**. Select the Direction for the circuit pack to be replaced (West for slot 1 or East for slot 2) and *Manual to Protection, Ring* Switch Type, and click **Apply**.
1+1 protection group,	Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

If a UPSR or 1+1 protection group, the system reports a `manual switch` condition.

If a BLSR protection group, the system reports the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

3 If required, repeat Step 1 to verify that the OC-n port is *not* active for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-28: Back out OC-n to DWDM OTS span upgrade

Overview

Use this procedure to back out an in-service OC-n span to DWDM OTS span upgrade in a 1+1/UPSR/BLSR network.

Backing out of an upgrade in progress returns the OC-n span to the pre-upgrade state.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- If required, the original OC-n pluggable transmission modules.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure.
3. Determine the local operating procedures for removing optical fibers from an OC-n port. Local operating procedures may vary. One method is to disconnect the optical fibers. Another method is to verify the OC-n port active/standby status, perform manual switches if the OC-n port is active, and then disconnect the optical fibers.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

When optical fibers are connected in a BLSR during this procedure, `Default K-bytes` alarms are reported temporarily.

Use this procedure to back out an in-service OC-n span to DWDM OTS span upgrade in a 1+1/UPSR/BLSR network.

1 From office records and work instructions, determine the current network configuration. Note how the nodes are connected and make a drawing to reference during this backout procedure.

2 Log in to a node that terminates the DWDM span to be backed out.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Determine the local operating procedures for removing optical fibers from an OC-n port before removing the required OC-n span fibers.

If local operating procedures specify...	Then...
Verify the OC-n port active/standby status, perform manual switches if the OC-n port is active, and then disconnect the optical fibers,	Continue with the next step.

If local operating procedures specify...	Then...
Disconnect the optical fibers,	Proceed to Step 7.

4 **Important!** If the port is active for transmission and the optical fibers are disconnected, the system performs an automatic protection switches and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the OC-n port.

Select **View** → **Protection** to access the required protection groups (according to the work instructions) and determine the active lines/paths supported by the OC-n port. Record the active lines/paths supported by the OC-n port. Click **Close**.

5 **Important!** If the OC-n port is active for transmission, optional manual switches can be performed before disconnecting the optical fiber. In UPSRs, each path supported by the OC-n port must be switched separately. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the OC-n port is *not* active for transmission, proceed to Step 7.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**.

If the required port is part of a ...	Then ...
UPSR protection group,	Expand *Path Protection*, select the required path and click **Select**. Select the *Manual* Switch Type and click **Apply**.
BSLR protection group,	Select the required *2F BLSR* line and click **Select**. Select the Direction for the circuit pack to be replaced (West for slot 1 or East for slot 2) and *Manual to Protection, Ring* Switch Type, and click **Apply**.
1+1 protection group,	Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

If a UPSR or 1+1 protection group, the system reports a `manual switch` condition.

If a BLSR protection group, the system reports the `Protection Switch, OC48 Port, Manual Switch, MSR, 2F` condition (Not Alarmed).

6 If required, repeat Step 4 to verify that the OC-n port is *not* active for transmission; otherwise, continue with the next step.

7 

NOTICE

Service-disruption hazard

Removing the wrong fiber connections will result in a service interruption.

Using the work instructions, ensure that you remove only the fiber connections for the optical span being upgraded.



NOTICE

Service-disruption hazard

Disconnecting the optical fiber from the OMD circuit pack OTS port will result in a service interruption if OCH ports are carrying traffic.

Using office records, determine if any OCH ports, in addition to the OCH port being backed out, are carrying traffic. If any OCH ports, in addition to the OCH port being backed out are carrying traffic, do not disconnect the optical fiber from the OTS port.

Important! If an OC-n port connected to the XM10G/8 and OMD circuit pack or directly to the OMD circuit pack is active for transmission, disconnecting the optical fibers from the OTS port of the OMD circuit pack causes transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the required DWDM span fibers from the OTS port of the OMD circuit pack.

Result: Transmission hits (less than 60 ms) may occur if traffic exists on the OC-n port. If through traffic exists (UPSRs and BLSRs only), transmission hits (less than 60 ms) may occur at the nodes where the traffic is added/dropped.

The system reports `inc. LOS` alarms when the DWDM span fibers are disconnected.

For BLSR protection groups, the system also reports a `Line Automatic Switch` condition for the OC-n port.

Alarms may also be reported at other nodes in the network.

8 Log in to the node at the opposite end of DWDM span to be backed out and repeat Step 3 through Step 7. Then continue with the next step.

9

If the OLIU circuit pack OC-n port is connected to an...	Then...
OMD circuit pack OCH port,	Perform Procedure 10-16: "Delete optical channel (OCH) from DWDM network" (p. 10-98) to disconnect the optical fibers and remove the optical channel from the DWDM network.
XM10G/8 circuit pack OC-n client port,	Perform the following: 1. Disconnect the optical fibers between the OLIU OC-n port and XM10G/8 client port, and remove the OC-n client signal from the DWDM network. Refer to Procedure 10-18: "Delete SONET/GbE/Data client signal" (p. 10-104). 2. If required, disconnect the optical fibers between the XM10G/8 OTU2 port and OMD OCH port, and remove the optical channel from the DWDM network. Refer to Procedure 10-16: "Delete optical channel (OCH) from DWDM network" (p. 10-98).

10 If required at the terminating nodes, remove the OLIU DWDM pluggable transmission module and install the original OC-n pluggable transmission module.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

11 If required at the terminating nodes, provision the original OC-n pluggable transmission module parameters according to office records.

Reference: Procedure 4-19: "Provision pluggable transmission module" (p. 4-109)

12 Obtain the original LBO, clean all fiber connectors, and connect the transmit and receive OC-n span fibers to the original OLIU circuit pack OC-n port.

Result: The `inc. OCN LOS` alarms clear. Transmission is now supported on the original optical span.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

13 If required at the terminating nodes, remove the XM10G/8 and/or OMD circuit packs from the shelf and select **Configuration** → **Update System** → **Update Inventory**.

14 At each terminating node, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms and standing conditions.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 12-29: Upgrade TMUX/DS3/EC1 to LNW20 48TMUXDS3EC1 circuit pack

Overview

Use this procedure to upgrade the following in-service TMUX/DS3/EC1 circuit packs in a Function/Growth group:

- LNW16 12DS3/EC1 to LNW20 48TMUXDS3EC1
- LNW19/19B 48DS3/EC1 to LNW20 48TMUXDS3EC1
- LNW18 12TMUX to LNW20 48TMUXDS3EC1

Important! The LNW20 48TMUXDS3EC1 circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The standard Alcatel-Lucent 1665 DMX Shelf does not support the LNW20 48TMUXDS3EC1 circuit packs. If an LNW20 48TMUXDS3EC1 circuit pack is installed in the standard Alcatel-Lucent 1665 DMX Shelf, the system will not recognize the circuit pack as an allowable type.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- TMUX/DS3/EC1 24-port cables for ports 1 through 24 and ports 25 through 48. For information about cabling, refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.
- Two LNW20 48TMUXDS3EC1 circuit packs for each Function (ported mode) or Growth (portless mode) group to be upgraded.

Release 9.0 or later software is required to support this in-service upgrade.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure, and verify that the affected circuit pack/protection group AIDs are specified.
3. Verify that the circuit packs to be upgraded are protected. Both Function/Growth slots must be equipped before performing this procedure. If necessary, install the companion circuit pack. Refer to the appropriate procedure in Chapter 4, "Install and provision circuit packs/OLIUs procedures".
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.

Steps

Complete the following steps to upgrade the in-service TMUX/DS3/EC1 circuit packs in a Function/Growth group:

1 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

4 **Important!** The original DS3/EC1/TMUX cabling may be 12-port cables or 24-port cables. The 24-port cables are required to support the LNW20 48TMUXDS3EC1 circuit packs.

Refer to office records and visually inspect the shelf to determine the original TMUX/DS3/EC1 cable type.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*

5 

NOTICE

Service-disruption hazard

The TMUX/DS3/EC1 12-port cables cover ports 1 - 12 on both companion circuit packs and cannot be removed or replaced without interrupting service at this time.

Do not replace the TMUX/DS3/EC1 12-port cables for ports 1 - 12 at this time.

Install the TMUX/DS3/EC1 24-port cables for the additional ports 25 through 48 only.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*

6 **Important!** Local operating procedures for removing a circuit pack may vary. One method is to simply remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the circuit pack in slot 1 of the Function/Growth group.

If the local operating procedures specify…	Then…
remove the circuit pack,	Proceed to Step 9.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then remove the circuit pack,	Continue with Step 7.

7 **Important!** The circuit pack in slot 1 of the Function/Growth group must be replaced first. Perform this step to determine if the circuit pack in slot 1 of the Function/Growth group is active for transmission.

From the System View select **Reports** → **Status Lists** → **Pack**. Click on *Shelf* and **Select**. Observe the value of the *Switch State* parameter for the required circuit pack (according to the work instructions). If the *Switch State* parameter is *active*, the circuit pack in slot 1 of the Function/Growth group is the active circuit pack for transmission. Click **Close**.

8 **Important!** This step is optional. If the circuit pack in slot 1 of the Function/Growth group is the active circuit pack for transmission, then a manual switch must be performed before replacing the circuit pack.

If the circuit pack in slot 2 of the Function/Growth group is the active circuit pack for transmission, do *not* perform this step.

To perform a manual transmission switch, select **Fault** → **Protection Switch**. Click on the required *1+1 Equip* protection group (according to the work instructions) and **Select**. Select the *Manual (Normal)* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**. Then click **Close**.

9 Replace the circuit pack in slot 1 of the Function/Growth group with the replacement LNW20 48TMUXDS3EC1 circuit pack.

Result: If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` slot conditions when the replacement LNW20 48TMUXDS3EC1 circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected CP type` alarm for slot 1 of the Function/Growth group.

If a circuit pack firmware update is not required, the system reports an `unexpected CP type` alarm for slot 1 of the Function/Growth group when the replacement LNW20 48TMUXDS3EC1 circuit pack is inserted.

10 **Important!** The **UPD/INIT** button does not work during this upgrade.

From the System View select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement LNW20 48TMUXDS3EC1 circuit pack in slot 1 of the Function/Growth group is autoprovisioned, and the system performs an automatic circuit pack protection switch. Traffic is automatically switched from the circuit pack in slot 2 of the Function/Growth group to the circuit pack in slot 1 of the Function/Growth group.

All traffic is now active on the circuit pack in slot 1 of the Function/Growth group.

The `unexpected CP type` alarm for slot 1 of the Function/Growth group clears, and the system reports an `CP not allowed - eqpt` alarm for slot 2 of the Function/Growth group.

11 Replace the companion circuit pack in slot 2 of the Function/Growth group with the replacement LNW20 48TMUXDS3EC1 circuit pack.

Result: The replacement LNW20 48TMUXDS3EC1 circuit pack in slot 2 of the Function/Growth group is autoprovisioned and all alarms clear.

12 This completes the TMUX/DS3/EC1 circuit pack upgrade in a Function/Growth group. If the TMUX/DS3/EC1 circuit packs in other Function/Growth groups are to be upgraded at this node, repeat Step 6 through Step 11; otherwise, continue with the next step.

13



NOTICE

Service-disruption hazard

The TMUX/DS3/EC1 12-port cables cover the ports on both companion circuit packs and cannot be removed or replaced without interrupting service.

To prevent service interruptions, traffic on ports 1 through 12 must be bridged/rolled to ports 25 through 37, respectively, before replacing the 12-port cables.

If shelf is equipped with...	Then...
12-port cables,	Continue with the next step.
24-port cables,	Proceed to Step 21.

14 **Important!** All cross-connections that are associated with ports 1 through 12 of the LNW20 48TMUXDS3EC1 circuit packs must be identified so that traffic can be moved to ports 25 through 37.

Select **View** → **Cross-Connections**. Click on the LNW20 48TMUXDS3EC1 circuit pack in slot 1 of the required Function/Growth group and **Select** to obtain the current list of cross-connections. Identify and record all cross-connections for ports 1 through 12. Click **Close** to exit.

15 At the local node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections for ports 1-12 to ports 25-37, respectively on the TMUX/DS3/EC1 circuit pack in slot 1 of the required Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

16 At the customer equipment connected to ports 1 to 12 at the DSX panel, bridge the corresponding cross-connections.

17 At the local node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections for ports 1-12 to ports 25-37, respectively on the TMUX/DS3/EC1 circuit pack in slot 1 of the required Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

18 At the customer equipment connected to ports 1 through 12 at the DSX panel, roll the corresponding cross-connections.

19 At the local node, replace the 12-port cables with the 24-port cables for ports 1 through 24.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*

20 If required, repeat Step 14 through Step 18 to bridge and roll traffic back to ports 1 through 12.

21 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-9: "Backup and restore NE database using SFTP" (p. 2-144)
- Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155)
- Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167)
- Procedure 2-12: "Backup and restore NE database via FTAM" (p. 2-182)

END OF STEPS

Procedure 12-30: Upgrade OC-3 1+1 network to OC-12 1+1 network (single-rate circuit packs)

Overview

Use this procedure to upgrade the OC-n bandwidth capacity of an in-service OC-3 1+1 network to an OC-12 1+1 network.

Important! The optical 1+1 network must be equipped with Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend nodes only connected to the network using single-rate circuit packs. This upgrade procedure does *not* support upgrading optical 1+1 networks equipped with nodes other than Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend.

This procedure assumes that an Alcatel-Lucent 1665 DMX node is interconnected in an optical 1+1 network using the a port pair of LNW37 or LNW45 circuit packs in the Function/Growth slots of with one of the following nodes:

- Another Alcatel-Lucent 1665 DMX node using a port pair of LNW37 or LNW45 circuit packs in the Function/Growth slots.
- An Alcatel-Lucent 1665 DMXtend node using a port pair in the Function/Growth slots.

Note: If you wish to upgrade an OC-3 1+1 network between a port pair of LNW37 or LNW45 circuit packs in the Function/Growth slots of Alcatel-Lucent 1665 DMX and a port pair in the main slots of Alcatel-Lucent 1665 DMXtend, please refer to *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*.

This procedure assumes that the circuit pack in Function/Growth slot 1 is always connected to the circuit pack in Function/Growth slot 1 at the far-end node, and the circuit pack in Function/Growth slot 2 is always connected to the circuit pack in Function/Growth slot 2 at the far-end node. (Refer to the "1+1 network configuration example" (p. 12-547) at the end of the procedure.)

Traffic is bridged/rolled to an OC-12 port pair in a different Function/Growth group.

Ring Upgrade Mode

During the upgrade, each node connected to the optical 1+1 network can be provisioned in the Ring Upgrade Mode. The Ring Upgrade Mode prohibits the following operations:

- Software upgrades to the node (**APPLY**, **INS-PRGM**)
- Cross-connection provisioning (**ENT-CRS**, **DLT-CRS**)
- Manual equipment protection switching of the Function/Growth slots (**SW-TOPROTN**, **SW-TOWKG**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded optical 1+1 network, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, "System configuration procedures".

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- As optical spans are upgraded in the 1+1 network, ensure that technicians are available at each end of an optical span as it is upgraded.
- At each Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend node connected to the 1+1 network using a port pair in the Function/Growth slots, an OC-12 port pair an OC-12 OLIU circuit pack pair in a different Function/Growth group

  If required, install the OC-12 OLIU circuit packs and/or pluggable transmission modules in the Function/Growth group and provision the OC-12 port and DCC termination parameters. Refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures".

NOTICE

Equipment damage

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the 1+1 network and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-12 OLIU circuit packs. Ensure that the OC-12 OLIU circuit packs are compatible with each fiber span in the 1+1 network. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Customer Release Notes* .
5. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this upgrade procedure.
6. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-3 1+1 network to an OC-12 1+1 network where the nodes are connected using the Function/Growth slots at both nodes.

1 From office records and work instructions, determine the current 1+1 network configuration. Note how the nodes are connected in the 1+1 network and make a drawing of the 1+1 network to reference during this upgrade procedure.

Reference: Refer to the "1+1 network configuration example" (p. 12-547) at the end of the procedure.

2 Identify and log in to an Alcatel-Lucent 1665 DMX node in the 1+1 network to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble-clearing procedures to clear all existing alarms before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

5 **Important!** Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support test access.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

6 Log in to the other node in the 1+1 network and repeat Step 3 through Step 5. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 

NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-32.5: "Verify spanning tree configuration" (p. 12-593)

8 Identify and log in to the far-end node connected to the 1+1 network using a port pair in the Function/Growth slots.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

9 **Important!** An OC-12 port pair must be available in a different Function/Growth group.

To verify that the upgrade OC-12 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the OC-12 port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the upgrade OC-12 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

10 To verify that the upgrade OC-12 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the upgrade OC-12 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

11 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the OC-3 ports that are to be upgraded, the Optical Synchronization Source must be reprovisioned to an upgrade OC-12 port or to a different OC-n port not involved in the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

12 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an upgrade OC-12 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the upgrade OC-12 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

13 Identify and log in to the near-end node connected to the 1+1 network using a port pair in the Function/Growth slots and repeat Step 9 through Step 12.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

14 **Important!** All cross-connections at the far-end node that are associated with the existing OC-3 1+1 network must be identified so that traffic can be moved to the OC-12 1+1 network.

At the far-end node, select **View** → **Cross-Connections**. Expand the required OC-3 OLIU circuit pack in slot 1 of the Function/Growth group that is currently connected to the OC-3 1+1 network. Click on the required OC-3 port and **Select** to obtain the current list of cross-connections. Identify and record all add and drop cross-connections. Click **Close** to exit.

15 For each *add* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

16 At the near-end node, repeat Step 14 and Step 15.

17



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-3 circuit pack is upgraded at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports `inc. OC3 LOS` alarms for the original OC-3 ports. Alarms may also be reported at other nodes.

18 At the near-end node, repeat Step 17.

19 At both ends of the optical span to be upgraded, perform the following to connect the OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group and the OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group at the opposite end of the upgraded OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

20 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

21 For each *drop* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

22 At the near-end node, repeat Step 20 and Step 21.

23



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-3 circuit pack is upgraded at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports `inc. OC3 LOS` alarms for the original OC-3 ports. Alarms may also be reported at other nodes.

24 At the near-end node, repeat Step 23.

25 At both ends of the optical span to be upgraded, perform the following to connect the OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group and the OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group at the opposite end of the upgraded OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

26 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

27 If required at the near-end node, repeat Step 26.

28 Continue with Step 29.

29 **Important!** At nodes connected to the 1+1 network, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the 1+1 network, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

30 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. OC3 LOS` alarms for the original OC-3 ports clear.

31 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add cross-connections to the original OC-3 ports.

32 **Important!** The 1+1 network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node can *not* be returned to the pre-upgrade state using the backout procedure.

At each node connected to the 1+1 network, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

33 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the 1+1 network, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

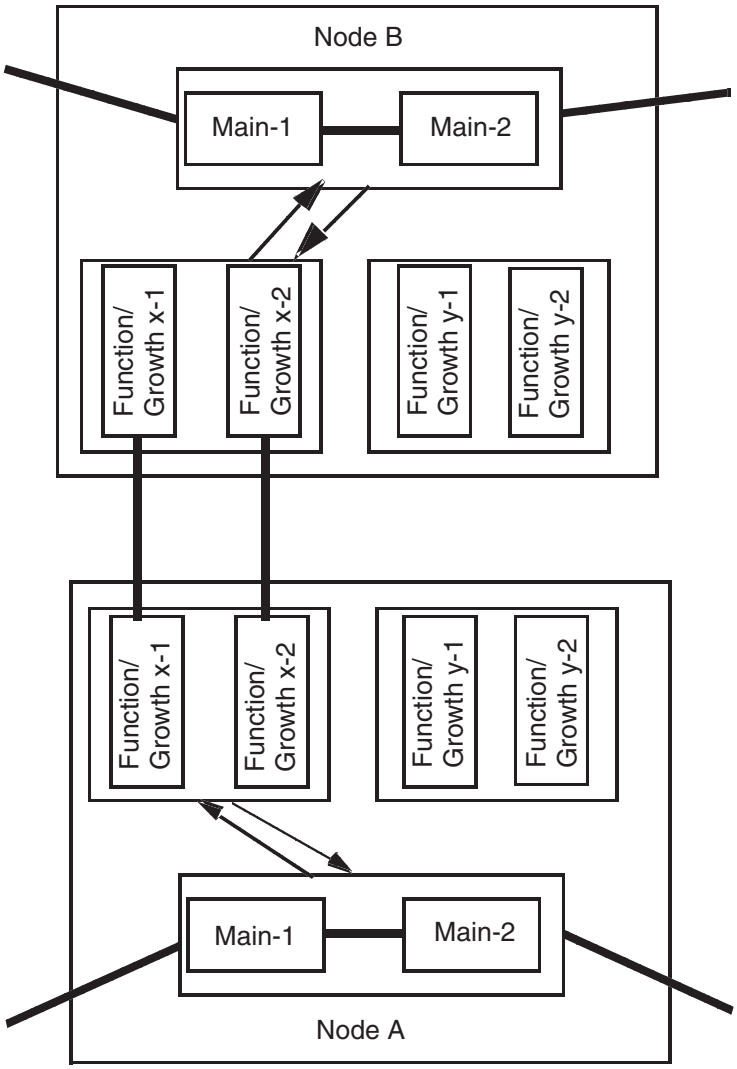
Reference:

- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

END OF STEPS

1+1 network configuration example

Figure 12-10 Nodes connected using Function/Growth slots



function-function

Procedure 12-31: Back out OC-3 1+1 to OC-12 1+1 upgrade (single-rate circuit packs)

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the 1+1 network can be provisioned in the Ring Upgrade Mode.

Use this procedure to back out an OC-3 1+1 to OC-12 1+1 upgrade.

Backing out of an upgrade in progress returns *all* nodes in the 1+1 network to their pre-upgrade state.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OC-3 OLIU circuit packs/port pairs for the near-end and far-end nodes
- As the upgrade is backed out around the 1+1 network, ensure that technicians are available at each end of an optical span as the upgrade is backed out.

NOTICE

Equipment damage

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Customer Release Notes* for any detailed procedures or cautions that may apply to this backout procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Customer Release Notes*.
3. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this backout procedure.
4. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an in-service OC-3 1+1 network to an OC-12 1+1 network upgrade where the nodes are connected using the Function/Growth slots at both nodes.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 **Important!** At nodes connected to the 1+1 network, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the 1+1 network, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

3 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. OC12 LOS` alarms for the upgrade OC-12 ports clear.

4 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add cross-connections to the upgrade OC-12 ports.

5 Identify the last node that was upgraded.

If the last node upgraded is the...	Then...
near-end node and the 1+1 network upgrade is complete,	Continue with the next step.
far-end node and both Function/Growth slots have been upgraded,	Proceed to Step 12.
far-end node and only Function/Growth slot 1 has been upgraded,	Proceed to Step 21.

6 Identify and log in to the far-end node connected to the 1+1 network using a port pair in the Function/Growth slots.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 **Important!** This procedure assumes that the far-end node is still equipped with the original OC-3 OLIU circuit packs/pluggable transmission modules.

To verify that the original OC-3 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original OC-3 port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the original OC-3 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

8 To verify that the original OC-3 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the original OC-3 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

9 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the upgrade OC-12 ports, the Optical Synchronization Source must be reprovisioned to an original OC-3 port or to a different OC-n port not involved in backing out the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

10 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an original OC-3 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the original OC-3 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

11 Identify and log in to the near-end node connected to the 1+1 network using a port pair in the Function/Growth slots and repeat Step 7 through Step 10.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

12 **Important!** All cross-connections at the far-end node that are associated with the existing OC-12 1+1 network must be identified so that traffic can be moved to the original OC-3 1+1 network.

At the far-end node, select **View** → **Cross-Connections**. Expand the required OC-12 OLIU circuit pack in slot 2 of the Function/Growth group that is currently connected to the OC-12 1+1 network. Click on the required OC-12 port and **Select** to obtain the current list of cross-connections. Identify and record all add and drop cross-connections. Click **Close** to exit.

13 For each *add* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

14 At the near-end node, repeat Step 12 and Step 13.

15



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the upgrade OC-12 circuit pack is backed out at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-12 port on the upgrade OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports `inc. OC12 LOS` alarms for the upgrade OC-12 ports. Alarms may also be reported at other nodes.

16 At the near-end node, repeat Step 15.

17 At both ends of the optical span to be backed out, perform the following to connect the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group and the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group at the opposite end of the original OC-3 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-3 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

18 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

19 For each *drop* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the original OC-3 port on the OC-3 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

20 At the near-end node, repeat Step 18 and Step 19.

21



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is backed out at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the upgrade OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports `inc. OC12 LOS` alarms for the upgrade OC-12 ports. Alarms may also be reported at other nodes.

22 At the near-end node, repeat Step 21.

23 At both ends of the optical span to be backed out, perform the following to connect the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the other Function/Growth group and the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the other Function/Growth group at the opposite end of the original OC-3 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-3 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC3 LOS` alarms clear. Transmission is now supported on the original optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

24 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-3 port on the OC-3 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

25 If required at the near-end node, repeat Step 24.

26 **Important!** This completes the backout procedure, except for taking the nodes connected to the 1+1 network out of the Ring Upgrade Mode. The decision to take these nodes out of the Ring Upgrade Mode or leave them depends on the reason the back out was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, cross-connections cannot be created or removed.

If required at each node connected to the 1+1 network, select **Configuration** → **Normal Mode**.

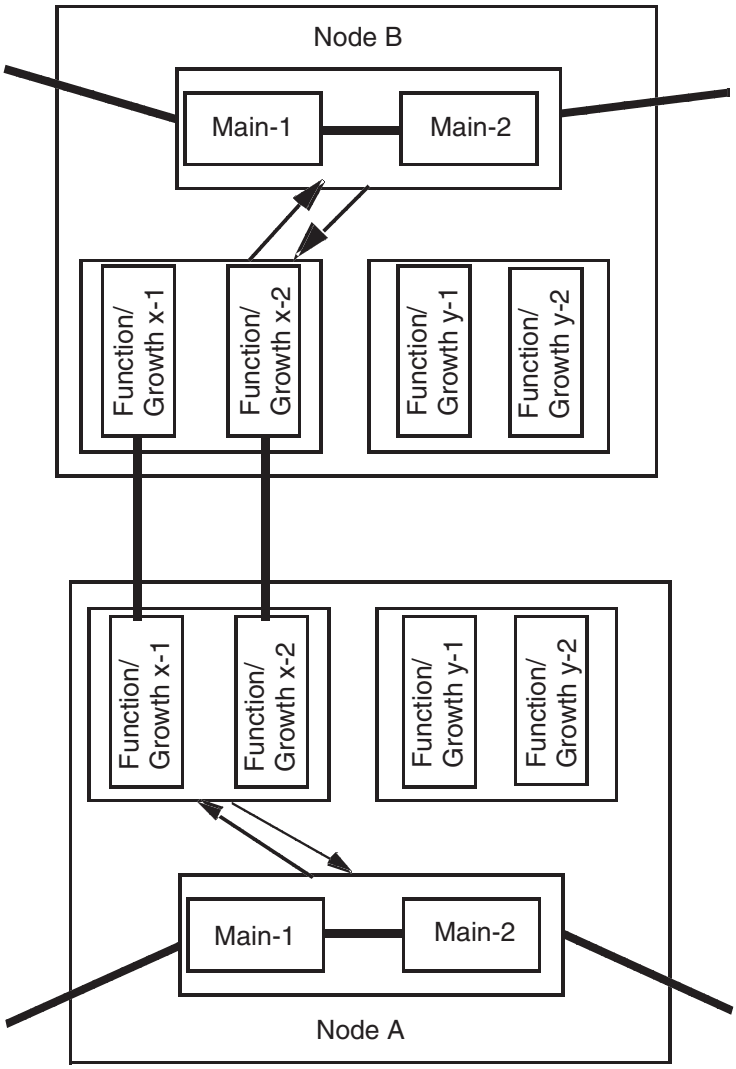
Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

1+1 network configuration example

Figure 12-11 Nodes connected using Function/Growth slots



function-function

Procedure 12-32: Upgrade OC-12 1+1 network to OC-48 1+1 network (single-rate circuit packs)

Overview

Use this procedure to upgrade the OC-n bandwidth capacity of an in-service OC-12 1+1 network to an OC-48 1+1 network.

> **Important!** The optical 1+1 network must be equipped with Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend nodes only connected to the network using single-rate circuit packs. This upgrade procedure does *not* support upgrading optical 1+1 networks equipped with nodes other than Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend.

This procedure assumes that an Alcatel-Lucent 1665 DMX node is interconnected in an optical 1+1 network using the Main slots or a port pair in the Function/Growth slots with one of the following nodes:

- Another Alcatel-Lucent 1665 DMX node using the Main slots or a port pair in the Function/Growth slots.
- An Alcatel-Lucent 1665 DMXtend node using the Main slots or a port pair in the Function/Growth slots.

At nodes using the Main slots, the OC-12 OLIU circuit packs in the Main slots are replaced with OC-48 OLIU circuit packs. At nodes using a port pair in the Function/Growth slots, traffic is bridged/rolled to an OC-48 port pair in a different Function/Growth group.

This procedure assumes that the circuit pack in Main/Function/Growth slot 1 is always connected to the circuit pack in Main/Function/Growth slot 1 at the far-end node, and the circuit pack in Main/Function/Growth slot 2 is always connected to the circuit pack in Main/Function/Growth slot 2 at the far-end node. (Refer to the "1+1 network configuration examples" (p. 12-566) at the end of the procedure.)

Ring Upgrade Mode

During the upgrade, each node connected to the optical 1+1 network using the Main slots must be provisioned in the Ring Upgrade Mode. The Ring Upgrade Mode allows cross-connections and provisioning data to be mapped to the replacement circuit pack and prohibits the following operations:

- Software upgrades to the node (**APPLY**, **INS-PRGM**)
- Cross-connection provisioning (**ENT-CRS**, **DLT-CRS**)
- Manual equipment protection switching of the Function/Growth slots (**SW-TOPROTN**, **SW-TOWKG**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded optical 1+1 network, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, "System configuration procedures".

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: "Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds" (p. 7-26).

Multi-shelf digital cross-connect applications

In multi-shelf digital cross-connect applications upgrading the 1+1 OC-12 subshelf interfaces between the main shelf and a subshelf are not supported.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- As optical spans are upgraded around the 1+1 network, ensure that technicians are available at each end of an optical span as it is upgraded.
- At the Alcatel-Lucent 1665 DMX starting node connected to the 1+1 network using the Main slots, one LNW26B OC-48 OLIU circuit pack with the enhanced/normal jumper set to enhanced is temporarily required.
  An LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack may also be used as the temporary replacement circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.
  The LNW26B, LNW28, LNW77, and LNW121B-159B circuit packs have been DA'ed; however, there are limited number of codes available. Please contact you Account Executive to obtain the required circuit pack to complete this upgrade. Also refer to Appendix B, "Circuit pack availability".

Product ID	Ordering Description
109543926	Circuit Pack, 1665 DMX, Reuse, LNW26B, OC48
109550707	Circuit Pack, 1665 DMX, Reuse, LNW28, OC48
109548081	Circuit Pack, 1665 DMX, Reuse, LNW77, OC48
109549683	Circuit Pack, 1665 DMX, Reuse, LNW121B, OC48

Product ID	Ordering Description
109549691	Circuit Pack, 1665 DMX, Reuse, LNW123B, OC48
109549709	Circuit Pack, 1665 DMX, Reuse, LNW125B, OC48
109549717	Circuit Pack, 1665 DMX, Reuse, LNW127B, OC48
109549808	Circuit Pack, 1665 DMX, Reuse, LNW131B, OC48
109549824	Circuit Pack, 1665 DMX, Reuse, LNW133B, OC48
109549907	Circuit Pack, 1665 DMX, Reuse, LNW135B, OC48
109549915	Circuit Pack, 1665 DMX, Reuse, LNW137B, OC48
109549923	Circuit Pack, 1665 DMX, Reuse, LNW143B, OC48
109549931	Circuit Pack, 1665 DMX, Reuse, LNW145B, OC48
109549949	Circuit Pack, 1665 DMX, Reuse, LNW147B, OC48
109549956	Circuit Pack, 1665 DMX, Reuse, LNW149B, OC48
109549964	Circuit Pack, 1665 DMX, Reuse, LNW153B, OC48
109549972	Circuit Pack, 1665 DMX, Reuse, LNW155B, OC48
109549980	Circuit Pack, 1665 DMX, Reuse, LNW157B, OC48
109549998	Circuit Pack, 1665 DMX, Reuse, LNW159B, OC48

- At each Alcatel-Lucent 1665 DMX node connected to the 1+1 network using the Main slots, 2 replacement LNW27, LNW29, LNW32, LNW76, or LNW202 OC-48 OLIU circuit packs.

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.

- At each Alcatel-Lucent 1665 DMX or Alcatel-Lucent 1665 DMXtend node connected to the 1+1 network using a port pair in the Function/Growth slots, an OC-48 port pair on an OC-48 OLIU circuit pack pair in a different Function/Growth group.

  If required, install the OC-48 OLIU circuit packs in the Function/Growth group and provision the OC-48 port and DCC termination parameters. Refer to Chapter 4, "Install and provision circuit packs/OLIUs procedures".

  The replacement circuit packs *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.
- Refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for the circuit packs required at a Alcatel-Lucent 1665 DMXtend node connected to the 1+1 network using the Main slots or a port pair in the Function/Growth slots.

  Important! Release 9.0 or later software is required to support the OC-12 1+1 network to OC-48 1+1 network upgrade.

  Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the 1+1 network and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the OC-48 OLIU circuit packs. Ensure that the OC-48 OLIU circuit packs are compatible with each fiber span in the 1+1 network. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Customer Release Notes* .
5. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this upgrade procedure.
6. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-12 1+1 network to an OC-48 1+1 network.

1 From office records and work instructions, determine the current 1+1 network configuration. Note how the nodes are connected in the 1+1 network and make a drawing of the 1+1 network to reference during this upgrade procedure.

Reference: Refer to the "1+1 network configuration examples" (p. 12-566) at the end of the procedure.

2 Identify and log in to an Alcatel-Lucent 1665 DMX node in the 1+1 network to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble-clearing procedures to clear all existing alarms before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

5 **Important!** Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support test access.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: "View test access sessions" (p. 14-136)
- Procedure 14-26: "Delete test access session" (p. 14-135)

6 Log in to the other node in the 1+1 network and repeat Step 3 through Step 5. Then continue with the next step.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7



NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-32.5: "Verify spanning tree configuration" (p. 12-593)

8

If upgrading a 1+1 network where the nodes are connected using the...	Then upgrade the 1+1 network using...
Main slots at both nodes,	Procedure 12-32.1: "Upgrade OC-12 1+1 network (main-to-main)" (p. 12-569). Then continue with Step 9.

If upgrading a 1+1 network where the nodes are connected using the...	Then upgrade the 1+1 network using...
Main slots at one node and the *Function/Growth* slots at the other node,	Procedure 12-32.2: "Upgrade OC-12 1+1 network (main-to-function/growth)" (p. 12-577). Then continue with Step 9.
Function/Growth slots at both nodes,	Procedure 12-32.3: "Upgrade OC-12 1+1 network (function/growth-to-function/growth)" (p. 12-586). Then continue with Step 9.

Reference: Refer to the "1+1 network configuration examples" (p. 12-566) at the end of the procedure.

9 **Important!** At nodes connected to the 1+1 network using the Main slots, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the 1+1 network using the Main slots, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

10 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. OC12 LOS` alarms for the original OC-12 ports clear.

11 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add cross-connections to the original OC-12 ports.

12 **Important!** The 1+1 network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node can *not* be returned to the pre-upgrade state using the backout procedure.

At each node connected to the 1+1 network using the Main slots, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

13 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, the OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs/port pairs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the 1+1 network, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

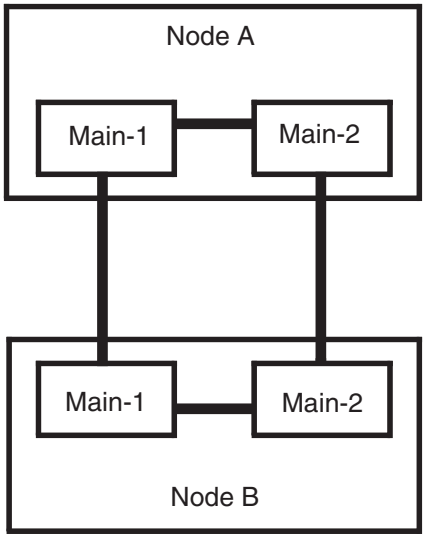
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

END OF STEPS

1+1 network configuration examples

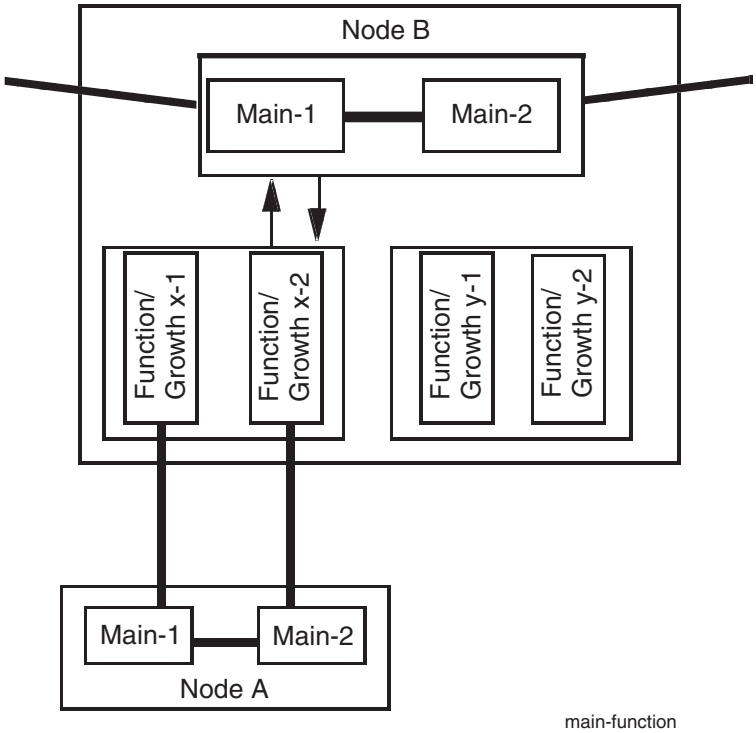
Nodes connected to the 1+1 network using the Main Slots

Figure 12-12 Nodes connected using Main slots



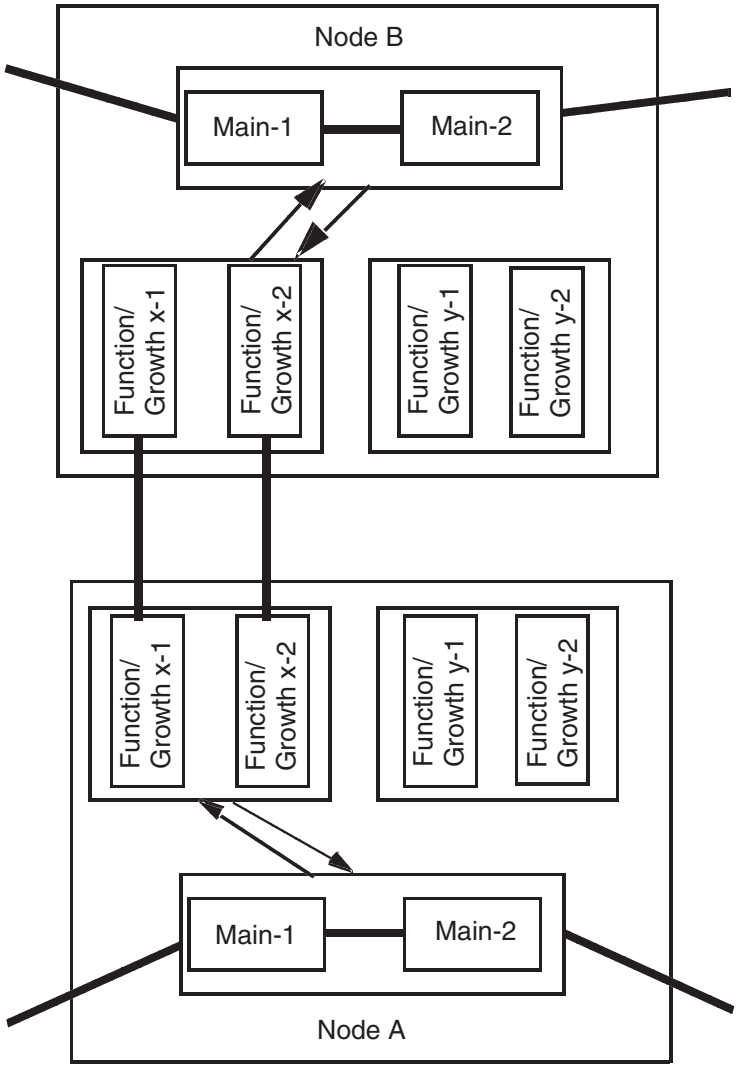
main-main

Figure 12-13 Nodes connected using Main slots and Function/Growth slots



main-function

Figure 12-14 Nodes connected using Function/Growth slots



function-function

Procedure 12-32.1: Upgrade OC-12 1+1 network (main-to-main)

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-12 1+1 network to an OC-48 1+1 network where the nodes are connected using the Main slots at both nodes.

1 Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network to be upgraded.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

2 If required at the near-end node, verify the active/standby status of the OC-12 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-32.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-591)

3 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-557).

4 Identify and log in to the far-end node in the 1+1 network to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

5 If required at the far-end node, verify the active/standby status of the OC-12 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-32.4: "Verify active/standby status of circuit pack to be replaced" (p. 12-591)

6 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-557).

7 **Important!** At the near-end node (starting node), the OC-12 OLIU circuit pack in Main slot **M1** must be first replaced with a temporary replacement OC-48 OLIU circuit pack. (Refer to "Required equipment" (p. 12-559) for a list of acceptable temporary replacement OC-48 OLIU circuit packs.) The temporary replacement OC-48 OLIU circuit pack maintains traffic while slot **M2** and the far-end node in the 1+1 network are upgraded. As a final step, this temporary replacement OC-48 OLIU circuit pack is upgraded.

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is upgraded at each end of the optical span.

At the near-end node, open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M1**. Replace the OC-12 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The temporary replacement circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` condition and an `inc. OC12 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

8 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

At the far-end node, open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M1**. Then replace the OC-12 OLIU circuit pack in Main slot **M1** with the replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M1**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

9 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 OLIU circuit pack in Main slot **M1** and the temporary replacement OC-48 circuit pack in Main slot **M1** at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the upgraded OC-48 optical span, the `inc. OC12 LOS` alarm clears.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

10



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the far-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1.** Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**. Alarms may also be reported at other nodes.

Transmission is now supported on the upgraded optical span between Main slot **M1** and the temporary replacement OC-48 circuit pack at the opposite end of the upgraded OC-48 optical span.

11 If required at the near-end, verify the active/standby status of the OC-12 circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-32.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-591)

12 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is upgraded at each end of the optical span.

At the far-end node, open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M2**. Then replace the OC-12 OLIU circuit pack in Main slot **M2** with the replacement OC-48 OLIU circuit pack.

Result: The replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

13 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M2**.

14 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

At the near-end node, open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M2**. Replace the OC-12 OLIU circuit pack in Main slot **M2** with the replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

15 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 circuit pack in the Main slot **M2** and the replacement OC-48 circuit pack in Main slot **M2** at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

16



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**. Alarms may also be reported at other nodes.

Transmission is now supported on the upgraded optical span between Main slot **M2** and the replacement OC-48 circuit pack at the opposite end of the upgraded OC-48 optical span.

17 At the near-end node, open the faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Then replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-48 OLIU circuit pack.

Result: The replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an inc. `OC48 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

18 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

19 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-32.2: Upgrade OC-12 1+1 network (main-to-function/growth)

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-12 1+1 network to an OC-48 1+1 network where the nodes are connected using the Main slots at one node and the Function/Growth slots at the other node.

1 Identify and log in to the far-end node connected to the 1+1 network using a port pair in the Function/Growth slots.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

2 **Important!** An OC-48 port pair must be available in a different Function/Growth group.

To verify that the upgrade OC-48 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the upgrade OC-48 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: “Provision OLIU circuit packs/ports for service” (p. 4-27)

3 To verify that the upgrade OC-48 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the upgrade OC-48 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

4 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the OC-12 ports that are to be upgraded, the Optical Synchronization Source must be reprovisioned to an upgrade OC-48 port or to a different OC-n port not involved in the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

5 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an upgrade OC-48 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the upgrade OC-48 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 **Important!** The starting node must be connected to the 1+1 network using the Main slots. This procedure assumes that the starting node is a Alcatel-Lucent 1665 DMX.

Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) connected to the 1+1 network using the Main slots.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 If required at the near-end node, verify the active/standby status of the OC-12 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-32.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-591)

8 **Important!** The Ring Upgrade Mode is required for cross-connections and provisioning data to be mapped to the replacement circuit pack.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to “Ring Upgrade Mode” (p. 12-557).

9 **Important!** At the near-end node (starting node), the OC-12 OLIU circuit pack in Main slot **M1** must be first replaced with a temporary replacement OC-48 OLIU circuit pack. (Refer to “Required equipment” (p. 12-559) for a list of acceptable temporary replacement OC-48 OLIU circuit packs.) The temporary replacement OC-48 OLIU circuit pack maintains traffic while slot **M2** and the far-end node in the 1+1 network are upgraded. As a final step, this temporary replacement OC-48 OLIU circuit pack is upgraded.

If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is upgraded at each end of the optical span.

At the near-end node, open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M1**. Replace the OC-12 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The temporary replacement circuit pack in Main slot **M1** is tested and autoprovisioned.

The system reports an `unexpected circuit pack type` condition and an `inc. OC12 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

10 **Important!** All cross-connections at the far-end node that are associated with the existing OC-12 1+1 network must be identified so that traffic can be moved to the OC-48 1+1 network.

Select **View** → **Cross-Connections**. Expand the required OC-12 OLIU circuit pack in slot 1 of the Function/Growth group that is currently connected to the OC-12 1+1 network. Click on the required OC-12 port and **Select** to obtain the current list of cross-connections. Identify and record all add and drop cross-connections. Click **Close** to exit.

11 For each *add* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

12 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system still reports an `inc. OC12 LOS` alarm for the OC-12 port.

13 At both ends of the optical span to be upgraded, perform the following to connect the OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group and the temporary replacement OC-48 circuit pack in Main slot **M1** at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

14 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

15 For each *drop* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group.

Result: Transmission is now supported on the upgraded optical span between the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group and the temporary replacement OC-48 circuit pack in Main slot **M1** at the opposite end of the upgraded OC-48 optical span.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

16 If required at the near-end node, verify the active/standby status of the OC-12 circuit pack in Main slot **M2** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-32.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-591)

17



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is upgraded at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports `inc. OC12 LOS` alarms for the original OC-12 ports. Alarms may also be reported at other nodes.

18 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M2**.

19 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

At the near-end node, open the faceplate latch on the OC-12 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-12 OLIU circuit pack in Main slot **M2**. Replace the OC-12 OLIU circuit pack in Main slot **M2** with the replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

20 At both ends of the optical span to be upgraded, perform the following to connect the replacement OC-48 circuit pack in the Main slot **M2** and the OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the other Function/Growth group at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

21



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement OC-48 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**. Alarms may also be reported at other nodes.

Transmission is now supported on the upgraded optical span between Main slot **M2** and the OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the other Function/Growth group at the opposite end of the upgraded OC-48 optical span.

22 At the near-end node, open the faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Then replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the replacement OC-48 OLIU circuit pack.

Result: The replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an inc. `OC48 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

23 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

24 Clean all fiber connectors, and connect the transmit and receive optical fibers to the replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC48 LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

25 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-32.3: Upgrade OC-12 1+1 network (function/growth-to-function/growth)

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service OC-12 1+1 network to an OC-48 1+1 network where the nodes are connected using the Function/Growth slots at both nodes.

1 Identify and log in to the far-end node connected to the 1+1 network using a port pair in the Function/Growth slots.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 **Important!** An OC-48 port pair must be available in a different Function/Growth group.

To verify that the upgrade OC-48 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the upgrade OC-48 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

3 To verify that the upgrade OC-48 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the upgrade OC-48 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

4 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the OC-12 ports that are to be upgraded, the Optical Synchronization Source must be reprovisioned to an upgrade OC-48 port or to a different OC-n port not involved in the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

5 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an upgrade OC-48 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the upgrade OC-48 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 Identify and log in to the near-end node connected to the 1+1 network using a port pair in the Function/Growth slots and repeat Step 2 through Step 5.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 **Important!** All cross-connections at the far-end node that are associated with the existing OC-12 1+1 network must be identified so that traffic can be moved to the OC-48 1+1 network.

At the far-end node, select **View** → **Cross-Connections**. Expand the required OC-12 OLIU circuit pack in slot 1 of the Function/Growth group that is currently connected to the OC-12 1+1 network. Click on the required OC-12 port and **Select** to obtain the current list of cross-connections. Identify and record all add and drop cross-connections. Click **Close** to exit.

8 For each *add* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

9 At the near-end node, repeat Step 7 and Step 8.

10

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is upgraded at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports `inc. OC12 LOS` alarms for the original OC-12 ports. Alarms may also be reported at other nodes.

11 At the near-end node, repeat Step 10.

12 At both ends of the optical span to be upgraded, perform the following to connect the OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group and the OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

13 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

14 For each *drop* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the other Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

15 At the near-end node, repeat Step 13 and Step 14.

16 

NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-12 circuit pack is upgraded at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports `inc. OC12 LOS` alarms for the original OC-12 ports. Alarms may also be reported at other nodes.

17 At the near-end node, repeat Step 16.

18 At both ends of the optical span to be upgraded, perform the following to connect the OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the other Function/Growth group and the OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the other Function/Growth group at the opposite end of the upgraded OC-48 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

19 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

20 If required at the near-end node, repeat Step 19.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-32.4: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **View** → **Protection** to access the required protection group (according to the work instructions) and determine if the circuit pack to be replaced is active for transmission. Record the active paths supported by the circuit pack to be replaced. Click **Close**.

5 **Important!** If the circuit pack to be replaced is active for transmission, optional manual switches can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* active for transmission, proceed to Step 6.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

The system reports a `manual switch` condition for the affected line.

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-32.5: Verify spanning tree configuration

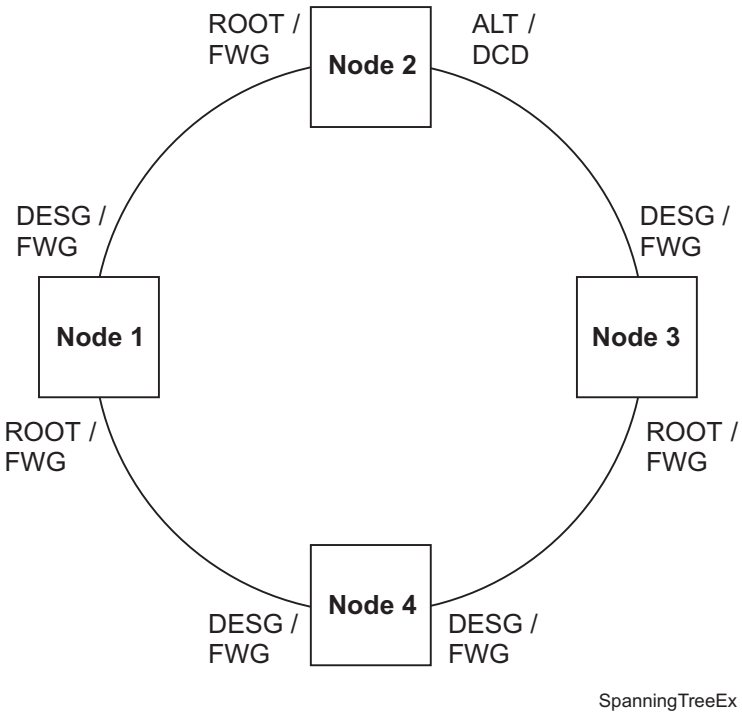
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-593).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

If required, change the existing spanning tree configuration.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-33: Back out OC-12 1+1 to OC-48 1+1 upgrade (single-rate circuit packs)

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the 1+1 network using the Main slots must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out an OC-12 1+1 to OC-48 1+1 upgrade.

Backing out of an upgrade in progress returns *all* nodes in the 1+1 network to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-34: “Suspend OC-12 1+1 to OC-48 1+1 upgrade (single-rate circuit packs)” (p. 12-626).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original OC-12 OLIU circuit packs/port pairs for the near-end and far-end nodes
- As the upgrade is backed out around the 1+1 network, ensure that technicians are available at each end of an optical span as the upgrade is backed out.

NOTICE

Equipment damage

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description*.
3. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this backout procedure.
4. Determine the local operating procedures for removing a circuit pack. Local operating procedures for removing a circuit pack may vary. One method is to disconnect the optical fibers and remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then disconnect the optical fibers and remove the circuit pack.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out of an OC-12 1+1 to OC-48 1+1 upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2

If backing out a 1+1 network upgrade where the nodes are connected using the...	Then back out the 1+1 network upgrade using...
Main slots at both nodes,	Procedure 12-33.1: "Back out OC-12 1+1 network upgrade (main-to-main)" (p. 12-603). Then continue with the next step.
Main slots at near-end node (starting node) and the *Function/Growth* slots at the far-end node,	Procedure 12-33.2: "Back out OC-12 1+1 network upgrade (main-to-function/growth)" (p. 12-610). Then continue with the next step.
Function/Growth slots at both nodes,	Procedure 12-33.3: "Back out OC-12 1+1 network upgrade (function/growth-to-function/growth)" (p. 12-618). Then continue with the next step.

Reference: Refer to the "1+1 network configuration examples" (p. 12-600) at the end of the procedure.

3 **Important!** At nodes connected to the 1+1 network using the Main slots, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the 1+1 network using the Main slots, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

4 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Update System** → **Update All**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `inc. OC48 LOS` alarms for the upgrade OC-48 ports clear.

5 At each node connected to the 1+1 network using a port pair in the Function/Growth slots, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to delete the remaining add cross-connections to the upgrade OC-48 ports.

6 **Important!** This completes the backout procedure, except for taking the nodes connected to the 1+1 network using the Main slots out of the Ring Upgrade Mode. The decision to take these nodes out of the Ring Upgrade Mode or leave them depends on the reason the back out was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, cross-connections cannot be created or removed.

If required at each node connected to the 1+1 network using the Main slots, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

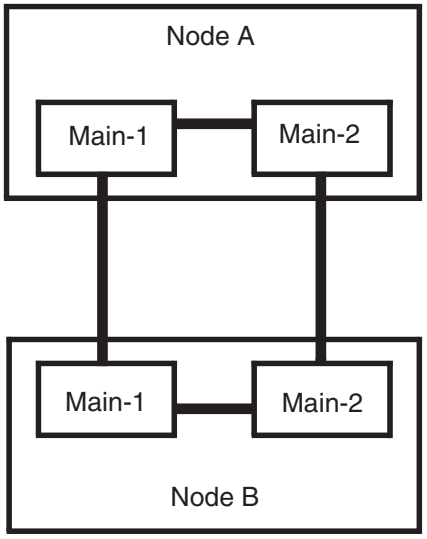
The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

1+1 network configuration examples

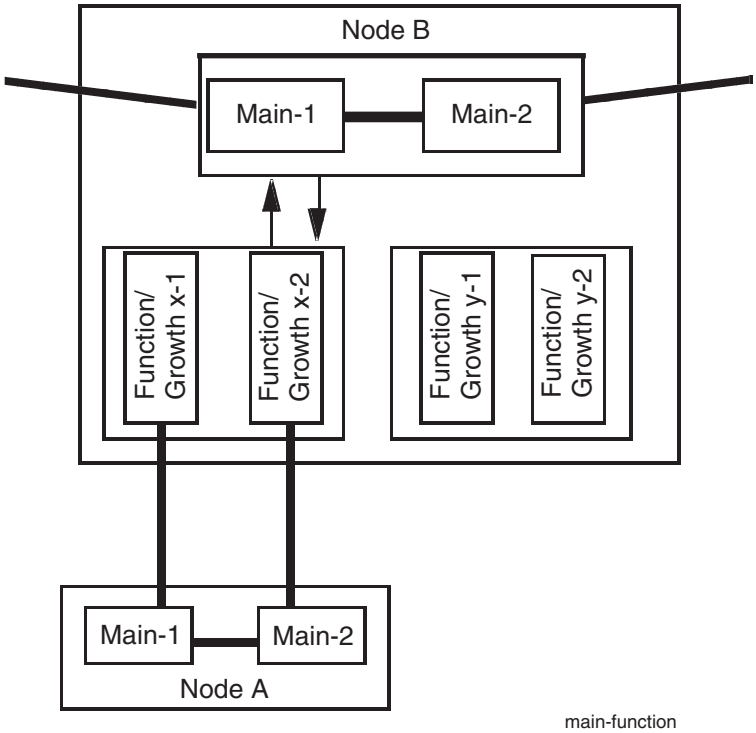
Nodes connected to the 1+1 network using the Main Slots

Figure 12-15 Nodes connected using Main slots



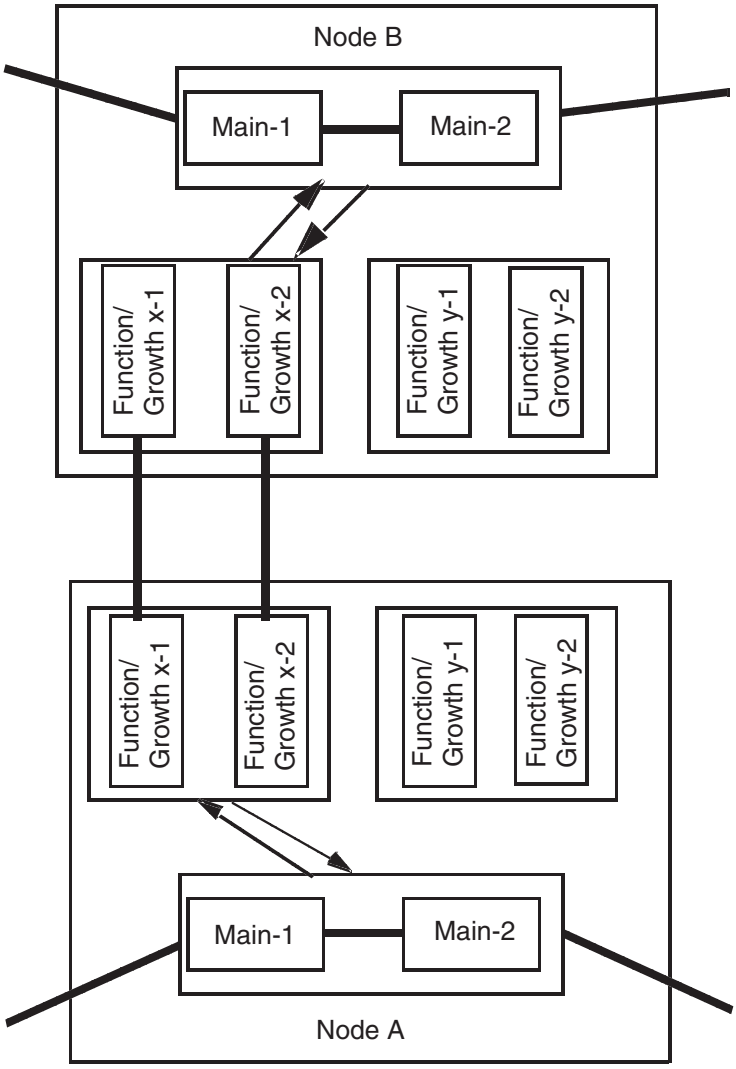
main-main

Figure 12-16 Nodes connected using Main slots and Function/Growth slots



main-function

Figure 12-17 Nodes connected using Function/Growth slots



function-function

Procedure 12-33.1: Back out OC-12 1+1 network upgrade (main-to-main)

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 1+1 network to an OC-48 1+1 network upgrade where the nodes are connected using the Main slots at both nodes.

1 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the near-end Alcatel-Lucent 1665 DMX node (starting node) and the 1+1 network upgrade is complete (all nodes connected to the 1+1 network using the Main slots are in the Ring Upgrade Mode),	Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network and continue with the next step.
the farend node and both Main slots have been upgraded,	Log in to the farend node and proceed to Step 10.
the farend node and only Main slot **M1** has been upgraded,	Log in to the farend node and proceed to Step 12.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 If required at the near-end node (starting node), verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-33.4: "Verify active/standby status of circuit pack to be replaced" (p. 12-624)

3 Identify and log in to the far-end node in the 1+1 network.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

4 If required at the far-end node, verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-33.4: "Verify active/standby status of circuit pack to be replaced" (p. 12-624)

5 At the near-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M1** . Alarms may also be reported at other nodes.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

6 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

7 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

8 

NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1.** Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**. Alarms may also be reported at other nodes.

Transmission is now supported on the optical span between Main slot **M1** and the OC-48 OLIU circuit pack at the far-end node.

9 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack is backed out at each end of the optical span.

At the near-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The original circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M2** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 At the far-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

11 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 circuit pack in the Main slot **M2** and the original OC-12 circuit pack in Main slot **M2** at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Result: At the opposite end of the original OC-12 optical span, the `inc. OC48 LOS` alarm clears.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

12 

NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the far-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**. Alarms may also be reported at other nodes.

Transmission is now supported on the original optical span between Main slot **M2** and the original OC-12 OLIU circuit pack at the near-end node.

13 If required at the near-end node, verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-33.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-624)

14 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack is backed out at each end of the optical span.

At the far-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Replace the OC-48 OLIU circuit pack in Main slot **M1** with the original OC-12 OLIU circuit pack.

Result: The original circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` alarm for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

15 **Important!** The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` condition for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M1**.

16 **Important!** If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

At the near-end node, open the faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the original OC-12 OLIU circuit pack.

Result: The original circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

17 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 circuit pack in the Main slot **M1** and the original OC-12 circuit pack in Main slot **M1** at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the original OC-12 optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

   STOP! *To complete backing out the 1+1 network upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-33.2: Back out OC-12 1+1 network upgrade (main-to-function/growth)

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an OC-12 1+1 network to an OC-48 1+1 network upgrade where the nodes are connected using the Main slots at the nearend node (starting node) and the Function/Growth slots at the farend node.

1 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the nearend Alcatel-Lucent 1665 DMX node (starting node) and the 1+1 network upgrade is complete (the starting node is still in the Ring Upgrade Mode),	Identify and log in to the far-end node connected to the 1+1 network using the Function/Growth slots and continue with the next step.
the far-end node and both Function/Growth slots have been upgraded,	Log in to the far-end node and proceed to Step 13.
the far-end node and only Function/Growth slot 1 has been upgraded,	Log in to the far-end node and proceed to Step 20.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

2 **Important!** This procedure assumes that the far-end node is still equipped with the original OC-12 OLIU circuit packs/pluggable transmission modules.

To verify that the original OC-12 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original OC-12 port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the original OC-12 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

3 To verify that the original OC-12 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the original OC-12 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

4 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the upgrade OC-48 ports, the Optical Synchronization Source must be reprovisioned to an original OC-12 port or to a different OC-n port not involved in backing out the upgrade.

At the far-end node, select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

5 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in backing out the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an original OC-12 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the original OC-12 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

6 Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) connected to the 1+1 network using the Main slots.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

7 If required at the near-end node, verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-33.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-624)

8 At the near-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M1** . Alarms may also be reported at other nodes.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

9 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

10 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

11



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1.** Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**. Alarms may also be reported at other nodes.

Transmission is now supported on the optical span between Main slot **M1** and the OC-48 circuit pack at the far-end node.

12

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack is backed out at each end of the optical span.

At the near-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The original circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M2** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: "Install OLIU circuit packs in Main slots" (p. 4-7)

13 **Important!** All cross-connections at the far-end node that are associated with the existing OC-48 1+1 network must be identified so that traffic can be moved to the original OC-12 1+1 network.

At the far-end node, select **View** → **Cross-Connections**. Expand the required OC-48 OLIU circuit pack in slot 2 of the Function/Growth group that is currently connected to the OC-48 1+1 network. Click on the required OC-48 port and **Select** to obtain the current list of cross-connections. Identify and record all add and drop cross-connections. Click **Close** to exit.

14 For each *add* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

15



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Disconnect the transmit and receive optical fibers from the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system still reports an `inc. OC48 LOS` alarm for the OC-48 port.

16 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group and the original OC-12 circuit pack in Main slot **M2** at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

17 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

18 For each *drop* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

19 If required at the near-end node, verify the active/standby status of the temporary replacement OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-33.4: "Verify active/standby status of circuit pack to be replaced" (p. 12-624)

20



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack is backed out at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports an `inc. OC48 LOS` alarm for the upgrade OC-48 port. Alarms may also be reported at other nodes.

21

Important! The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The `unexpected circuit pack type` condition for Main slot **M2** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M1**.

22

Important! If the circuit pack is active for timing and/or transmission, opening the latch causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

At the near-end node, open the faceplate latch on the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**. Replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the original OC-12 OLIU circuit pack.

Result: The original circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` condition for Main slot **M1** clears, and the system reports an `inc. OC12 LOS` alarm for Main slot **M1**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

23 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 circuit pack in the Main slot **M1** and the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the original OC-12 optical span.

Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

24 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: “Network Element synchronization provisioning” (p. 6-15)

STOP! *To complete backing out the 1+1 network upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-33.3: Back out OC-12 1+1 network upgrade (function/growth-to-function/growth)

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out an in-service OC-12 1+1 network to an OC-48 1+1 network upgrade where the nodes are connected using the Function/Growth slots at both nodes.

1 Identify the last node that was upgraded.

If the last node upgraded is the...	Then...
near-end node and the 1+1 network upgrade is complete,	Continue with the next step.
far-end node and both Function/Growth slots have been upgraded,	Proceed to Step 8.
far-end node and only Function/Growth slot 1 has been upgraded,	Proceed to Step 17.

2 Identify and log in to the far-end node connected to the 1+1 network using a port pair in the Function/Growth slots.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 **Important!** This procedure assumes that the far-end node is still equipped with the original OC-12 OLIU circuit packs/pluggable transmission modules.

To verify that the original OC-12 port parameters are provisioned correctly, select **View** → **Equipment** and expand the required circuit pack. Click on the original OC-12 port and **Select** to obtain the port parameters. Click **Close**.

If required, provision the original OC-12 port pair according to the work instructions using the **Configuration** → **Equipment** command.

Reference: Procedure 4-4: "Provision OLIU circuit packs/ports for service" (p. 4-27)

4 To verify that the original OC-12 port DCC parameters are provisioned correctly, select **View** → **DCC Terminations** to obtain the DCC channel status. Click **Close**.

If required, provision the original OC-12 port DCC parameters according to the office records using the **Configuration** → **DCC Terminations** command.

Reference: Procedure 6-4: "Provision DCC terminations" (p. 6-12)

5 **Important!** If the provisioned Timing Mode is *Line* and the Optical Synchronization Source is either of the upgrade OC-48 ports, the Optical Synchronization Source must be reprovisioned to an original OC-12 port or to a different OC-n port not involved in backing out the upgrade.

Select **View** → **Timing/Sync** to access the System Timing parameters and observe the provisioned Timing Mode and Optical Synchronization Source. Click **Close**.

If required, use local operating procedures to determine which OC-n line to provision as the new Optical Synchronization Source.

6 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to a different OC-n port not involved in the upgrade.

If the Optical Synchronization Source is to be reprovisioned to an original OC-12 port, the Optical Synchronization Source is reprovisioned later in this procedure only after transmission is supported on the original OC-12 span.

If required, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to a different OC-n port not involved in the upgrade.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

7 Identify and log in to the near-end node connected to the 1+1 network using a port pair in the Function/Growth slots and repeat Step 3 through Step 6.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

8 **Important!** All cross-connections at the far-end node that are associated with the existing OC-48 1+1 network must be identified so that traffic can be moved to the original OC-12 1+1 network.

At the far-end node, select **View** → **Cross-Connections**. Expand the required OC-48 OLIU circuit pack in slot 2 of the Function/Growth group that is currently connected to the OC-48 1+1 network. Click on the required OC-48 port and **Select** to obtain the current list of cross-connections. Identify and record all add and drop cross-connections. Click **Close** to exit.

9 For each *add* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to bridge the add cross-connections to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: “Bridge and roll cross-connections” (p. 10-50)

10 At the near-end node, repeat Step 8 and Step 9.

11



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the upgrade OC-48 circuit pack is backed out at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the required OC-48 port on the upgrade OC-48 OLIU circuit pack in slot 2 of the Function/Growth group.

Result: The system reports an `inc. OC48 LOS` alarm for the upgrade OC-48 port. Alarms may also be reported at other nodes.

12 At the near-end node, repeat Step 11.

13 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group and the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

14 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

15 For each *drop* cross-connection identified at the far-end node, select **Configuration** → **Cross-Connections** and use the *Cross-Connection Wizard* to roll the drop cross-connections to the original OC-12 port on the OC-12 OLIU circuit pack in slot 2 of the other Function/Growth group.

Reference: Procedure 10-10: "Bridge and roll cross-connections" (p. 10-50)

16 At the near-end node, repeat Step 14 and Step 15.

17



NOTICE

Service-disruption hazard

Removal of wrong fiber connections will result in a service interruption.

Ensure that you remove only the fiber connections for the optical span being upgraded.

Important! Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack is backed out at each end of the optical span.

At the far-end node, disconnect the transmit and receive optical fibers from the upgrade OC-48 port on the OC-48 OLIU circuit pack in slot 1 of the Function/Growth group.

Result: The system reports an `inc. OC48 LOS` alarm for the upgrade OC-48 port. Alarms may also be reported at other nodes.

18 At the near-end node, repeat Step 17.

19 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group and the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the other Function/Growth group at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: The `inc. OC12 LOS` alarms clear. Transmission is now supported on the original optical span.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

20 **Important!** Perform this step only if the Optical Synchronization Source is to be reprovisioned to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

If required at the far-end node, select **Configuration** → **Timing/Sync** to reprovision the Optical Synchronization Source to the original OC-12 port on the OC-12 OLIU circuit pack in slot 1 of the Function/Growth group.

Reference: Procedure 6-5: "Network Element synchronization provisioning" (p. 6-15)

21 If required at the near-end node, repeat Step 20.

STOP! *To complete backing out the 1+1 network upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-33.4: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **View** → **Protection** to access the required protection group (according to the work instructions) and determine if the circuit pack to be replaced is active for transmission. Record the active paths supported by the circuit pack to be replaced. Click **Close**.

5 **Important!** If the circuit pack to be replaced is active for transmission, optional manual switches can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* active for transmission, proceed to Step 6.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

The system reports a `manual switch` condition for the affected line.

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete backing out the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-34: Suspend OC-12 1+1 to OC-48 1+1 upgrade (single-rate circuit packs)

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the 1+1 network using the Main slots must be in the provisioned Ring Upgrade Mode.

> **Important!** This procedure starts at the last node upgraded. The last node upgraded must be connected to the 1+1 network using the Main slots. Suspending an upgrade at a node connected to the 1+1 network using port pairs in the Function/Growth slots is *not* supported.
>
> This procedure assumes that the last node upgraded is a Alcatel-Lucent 1665 DMX. However, the Alcatel-Lucent 1665 DMXtend can also be connected to a 1+1 network using the Main slots. If the upgrade is suspended at an Alcatel-Lucent 1665 DMXtend node, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325*.

Use this procedure to temporarily suspend an OC-12 1+1 to OC-48 1+1 upgrade where the near-end and far-end nodes are connected to the 1+1 network using single-rate circuit packs in the Main slots.

To temporarily stop the upgrade at a Alcatel-Lucent 1665 DMX node connected to the 1+1 network using multirate circuit packs in the Main/Function/Growth slots, refer to Procedure 12-37: “Suspend UPSR/1+1 upgrade at node (multirate circuit packs)” (p. 12-679).

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the 1+1 network to their pre-upgrade state, refer to Procedure 12-33: “Back out OC-12 1+1 to OC-48 1+1 upgrade (single-rate circuit packs)” (p. 12-597).

When the 1+1 upgrade is temporarily suspended before completion, one span is operating at the OC-12 line rate and the other span at the OC-48 line rate. This requires that the near-end and far-end nodes be equipped with an OC-12 OLIU circuit pack in one Main slot and an OC-48 OLIU circuit pack in the other Main slot. These nodes must be

connected to the 1+1 network using the Main slots. Suspending an upgrade when a node is connected to the 1+1 network using port pairs in the Function/Growth slots is *not* supported.

To continue to operate temporarily with different circuit packs in the Main slots, the near-end node (starting node) and the far-end node must remain in the Ring Upgrade Mode.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- One original OC-12 OLIU circuit pack at each node
- One LNW26B OC-48 OLIU circuit pack with the enhanced/normal jumper set to enhanced at each node

  An LNW28, LNW77, or LNW121B–159B OC-48 OLIU circuit pack may also be used as the temporary replacement circuit pack. However, the temporary replacement circuit pack *must* have compatible optics. For example, do *not* replace a circuit pack that has long reach optics with a circuit pack that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.

  The LNW26B, LNW28, LNW77, and LNW121B-159B circuit packs have been DA'ed; however, there are limited number of codes available. Please contact you Account Executive to obtain the required circuit pack. Also refer to Appendix B, "Circuit pack availability".

Product ID	Ordering Description
109543926	Circuit Pack, 1665 DMX, Reuse, LNW26B, OC48
109550707	Circuit Pack, 1665 DMX, Reuse, LNW28, OC48
109548081	Circuit Pack, 1665 DMX, Reuse, LNW77, OC48
109549683	Circuit Pack, 1665 DMX, Reuse, LNW121B, OC48
109549691	Circuit Pack, 1665 DMX, Reuse, LNW123B, OC48
109549709	Circuit Pack, 1665 DMX, Reuse, LNW125B, OC48

Product ID	Ordering Description
109549717	Circuit Pack, 1665 DMX, Reuse, LNW127B, OC48
109549808	Circuit Pack, 1665 DMX, Reuse, LNW131B, OC48
109549824	Circuit Pack, 1665 DMX, Reuse, LNW133B, OC48
109549907	Circuit Pack, 1665 DMX, Reuse, LNW135B, OC48
109549915	Circuit Pack, 1665 DMX, Reuse, LNW137B, OC48
109549923	Circuit Pack, 1665 DMX, Reuse, LNW143B, OC48
109549931	Circuit Pack, 1665 DMX, Reuse, LNW145B, OC48
109549949	Circuit Pack, 1665 DMX, Reuse, LNW147B, OC48
109549956	Circuit Pack, 1665 DMX, Reuse, LNW149B, OC48
109549964	Circuit Pack, 1665 DMX, Reuse, LNW153B, OC48
109549972	Circuit Pack, 1665 DMX, Reuse, LNW155B, OC48
109549980	Circuit Pack, 1665 DMX, Reuse, LNW157B, OC48
109549998	Circuit Pack, 1665 DMX, Reuse, LNW159B, OC48

NOTICE

Equipment damage

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this suspend procedure.

Steps

Important! This procedure starts at the last node upgraded. This procedure assumes that the last node upgraded is a Alcatel-Lucent 1665 DMX connected to a 1+1 network using the Main slots.

When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to temporarily suspend an OC-12 1+1 to OC-48 1+1 upgrade where the near-end and far-end nodes are connected to the 1+1 network using the Main slots.

1 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the Alcatel-Lucent 1665 DMX near-end node (starting node) and the 1+1 network upgrade is complete (all nodes connected to the 1+1 network using the Main slots are in the Ring Upgrade Mode),	Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network and continue with the next step.
far-end node and both Main slots have been upgraded,	Log in to the far-end node and proceed to Step 10.
far-end node and only Main slot **M1** has been upgraded,	Log in to the far-end node and proceed to Step 12.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

2 If required at the near-end node (starting node), verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-34.1: “Verify active/standby status of circuit pack to be replaced” (p. 12-636)

3 Identify and log in to the far-end node in the 1+1 network.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

4 If required at the far-end node, verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-34.1: “Verify active/standby status of circuit pack to be replaced” (p. 12-636)

5 At the near-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Then replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M1** . Alarms may also be reported at other nodes.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

6 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

7 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

8



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the near-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-1** (default) as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M1.** Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M2** to the circuit pack in Main slot **M1**.

The `unexpected CP type` alarm for Main slot **M1** clears, and the system reports an `unexpected CP type` alarm for Main slot **M2**. Alarms may also be reported at other nodes.

Transmission is now supported on the optical span between Main slot **M1** and the OC-48 OLIU circuit pack at the far-end node.

9 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the OC-48 circuit pack is backed out at each end of the optical span.

At the near-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The original circuit pack in Main slot **M2** is tested and autoprovisioned.

The `unexpected CP type` alarm for Main slot **M2** clears. The system reports an `unexpected circuit pack type` condition and an `inc. OC48 LOS` alarm for Main slot **M2**.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

10 At the far-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M2**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M2**. Then replace the OC-48 OLIU circuit pack in Main slot **M2** with the original OC-12 OLIU circuit pack.

Result: The system reports an `unexpected CP type` alarm for Main slot **M2**.

The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

11 At both ends of the optical span to be backed out, perform the following to connect the original OC-12 circuit pack in the Main slot **M2** and the original OC-12 circuit pack in Main slot **M2** at the opposite end of the original OC-12 optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-12 circuit packs.)
3. Clean and connect the receive fibers.

   Result: At the opposite end of the original OC-12 optical span, the `inc. OC48 LOS` alarm clears.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

12



NOTICE

Service-disruption hazard

If the OLIU circuit packs being upgraded carry Ethernet traffic with LCAS enabled, transmission hits (up to 6 seconds) may occur as Ethernet traffic is switched.

The length of the service hits varies based on shelf equipage and TDM/Ethernet service provisioning.

Important! The **UPD/INIT** button does not work during this upgrade.

At the far-end node, select **Configuration** → **Update System** → **Upgrade**. Select **main-2** as the Directed Slot Choice and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The original OC-12 OLIU circuit pack in Main slot **M2** is tested and autoprovisioned.

The system performs an automatic path protection switch, and all traffic is now active on Main slot **M2**. Transmission hits (less than 60 ms) occur as traffic switches from the circuit pack in Main slot **M1** to the circuit pack in Main slot **M2**.

The `unexpected CP type` alarm for Main slot **M2** clears, and the system reports an `unexpected CP type` alarm for Main slot **M1**. Alarms may also be reported at other nodes.

Transmission is now supported on the original optical span between Main slot **M2** and the original OC-12 OLIU circuit pack at the near-end node.

13 If required at the near-end node, verify the active/standby status of the OC-48 circuit pack in Main slot **M1** and perform manual switches to switch traffic away from an active circuit pack.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-33.4: “Verify active/standby status of circuit pack to be replaced” (p. 12-624)

14 At the far-end node, open the faceplate latch on the OC-48 OLIU circuit pack in Main slot **M1**. Disconnect the optical fibers from the OC-48 OLIU circuit pack in Main slot **M1**. Replace the OC-48 OLIU circuit pack in Main slot **M1** with the temporary replacement OC-48 OLIU circuit pack.

Result: The temporary replacement OC-48 OLIU circuit pack in Main slot **M1** is tested and autoprovisioned.

The `unexpected circuit pack type` alarm for Main slot **M1** clears, and the system reports an `unexpected circuit pack type` condition for Main slot **M1**. The system also reports an `inc. OC12 LOS` alarm for Main slot **M1**. Alarms may also be reported at other nodes.

Reference: Procedure 4-2: “Install OLIU circuit packs in Main slots” (p. 4-7)

15 Measure the optical receive power of the receive fiber using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications of the OC-48 OLIU circuit packs.)

16 Clean all fiber connectors, and connect the transmit and receive optical fibers to the temporary replacement OC-48 OLIU circuit pack in Main slot **M1**.

Result: The `inc. OC12 LOS` alarm for Main slot **M1** clears, and the system still reports an `unexpected circuit pack type` condition for Main slot **M1**.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

STOP! End of Procedure.

To resume the upgrade, replace the temporary replacement OC-48 OLIU circuit pack in Main slot **M1** with the upgrade OC-48 OLIU circuit pack, perform a system update, and replace the OC-12 OLIU circuit pack in Main slot **M2** with the upgrade OC-48 OLIU circuit pack. Refer to Procedure 12-32: “Upgrade OC-12 1+1 network to OC-48 1+1 network (single-rate circuit packs)” (p. 12-557).

To back out the upgrade, refer to Procedure 12-33: “Back out OC-12 1+1 to OC-48 1+1 upgrade (single-rate circuit packs)” (p. 12-597).

END OF STEPS

Procedure 12-34.1: Verify active/standby status of circuit pack to be replaced

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the circuit pack to be replaced and perform manual switches to switch traffic away from an active circuit pack.

1 **Important!** If the circuit pack to be replaced is the active circuit pack for timing and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the timing state of the circuit pack to be replaced.

Select **View** → **Timing/Sync**. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

2 **Important!** If the circuit pack to be replaced is the active circuit pack for timing, an optional manual timing switch can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* the active circuit pack for timing, proceed to Step 4.

To perform an optional manual timing switch, select **Fault** → **Timing/Sync Protection Switch** → **Main Circuit Pack Timing Switch**. Select the *Manual* Switch Command and click **OK**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

3 If required, repeat Step 1 to verify that the circuit pack to be replaced is *not* the active circuit pack for timing.

4 **Important!** If the circuit pack to be replaced is the active circuit pack for transmission and the circuit pack is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the circuit pack to be replaced.

Select **View** → **Protection** to access the required protection group (according to the work instructions) and determine if the circuit pack to be replaced is active for transmission. Record the active paths supported by the circuit pack to be replaced. Click **Close**.

5 **Important!** If the circuit pack to be replaced is active for transmission, optional manual switches can be performed before replacing the circuit pack. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the circuit pack to be replaced is *not* active for transmission, proceed to Step 6.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

The system reports a `manual switch` condition for the affected line.

6 If required, repeat Step 4 to verify that the circuit pack to be replaced is *not* the active circuit pack for transmission.

STOP! *To complete suspending the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-34.2: Place holder

Steps

1 This is a place holder for a future procedure.

END OF STEPS

Procedure 12-35: Upgrade 1+1 network (multirate circuit packs)

Overview

Use this procedure to upgrade the OC-n bandwidth capacity of an in-service 1+1 network. The following upgrades are supported:

- OC-3 to OC-12
- OC-12 to OC-48

Important! The optical 1+1 network must be equipped with Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend nodes only connected to the network using single multirate circuit packs in the Main/Function/Growth slots. This upgrade procedure does *not* support upgrading optical 1+1 networks equipped with nodes other than Alcatel-Lucent 1665 DMX and/or Alcatel-Lucent 1665 DMXtend. .

This procedure assumes that an Alcatel-Lucent 1665 DMX node is interconnected in an optical 1+1 network using multirate circuit packs in the Main/Function/Growth slots with one of the following nodes:

- Another Alcatel-Lucent 1665 DMX node using multirate circuit packs in the Main/Function/Growth slots.
- An Alcatel-Lucent 1665 DMXtend node using multirate circuit packs in the Main/Function/Growth slots.

At nodes connected to the 1+1 network using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots equipped with single-rate pluggable transmission modules, the original pluggable transmission modules are replaced with upgrade pluggable transmission modules.

At nodes connected to the 1+1 network using multirate OC-3/OC-12/OC-48 OLIU circuit packs in the Main/Function/Growth slots equipped with multirate pluggable transmission modules, the port Signal Type parameter of each port in the original port pair is independently reprovisioned to the upgrade port rate.

This procedure assumes that the circuit pack in Main/Function/Growth slot 1 is always connected to the circuit pack in Main/Function/Growth slot 1 at the far-end node, and the circuit pack in Main/Function/Growth slot 2 is always connected to the circuit pack in Main/Function/Growth slot 2 at the far-end node. (Refer to the "1+1 network configuration examples" (p. 12-655) at the end of the procedure.)

Ring Upgrade Mode

During upgrades with multirate OC-3/OC-12/OC-48 OLIU circuit packs, the Ring Upgrade Mode allows ports in the protected port pair to be independently reprovisioned and operate at different rates.

The Ring Upgrade Mode prohibits the following operations:

- Software upgrades to the node (**APPLY**, **INS-PRGM**)
- Cross-connection provisioning (**ENT-CRS**, **DLT-CRS**)
- Manual equipment protection switching of the Function/Growth slots (**SW-TOPROTN**, **SW-TOWKG**)

The node remains in the Ring Upgrade Mode until it is manually provisioned back to the Normal mode. While in the Ring Upgrade Mode, the upgrade may be temporarily suspended or backed out. To prevent errors in the upgraded optical 1+1 network, keep all nodes in Ring Upgrade Mode until all nodes have been upgraded.

The Ring Upgrade Mode is an abnormal condition. Therefore, the **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT *Alarm List* shows the Ring Upgrade Mode as Not Alarmed.

Reported alarm severity levels

The alarm severity levels are reported using the *Alarm List* and the SYSCTL circuit pack faceplate LED indicators (CR, MJ, MN, or ABN).

Alarm List

The *Alarm List* is obtained by clicking the **Alarm List** button. The *Alarm List* reports detailed information about the current alarms on the local network element. This includes the assigned ASAP alarm severity levels.

For more information about provisioning and assigning ASAPs, refer to Chapter 6, “System configuration procedures”.

SYSCTL circuit pack faceplate LEDs

The SYSCTL circuit pack faceplate LEDs report the highest active alarm severity level at the local network element or within the alarm group based on the provisioned value of the Remote NE Status parameter.

If the Remote NE Status parameter is...	Then...
Enabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) within the Alarm Group and the **FE** LED is lighted.
Disabled,	the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

If the Remote NE Status parameter is...	Then...
Enable Far End,	the SYSCTL circuit pack faceplate **FE** LED is lighted to indicate an alarm within the alarm group. However, the SYSCTL circuit pack faceplate LEDs at the local network element display the highest active alarm severity level (if any) at the local network element only.

For more information about provisioning the Remote NE Status feature, refer to Procedure 7-9: “Set NE defaults — alarm gateway, alarm group, remote NE status, FTP/FTTD, security and history log thresholds” (p. 7-26).

Multi-shelf digital cross-connect applications

In multi-shelf digital cross-connect applications upgrading the 1+1 OC-12 subshelf interfaces between the main shelf and a subshelf are not supported.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- As optical spans are upgraded in the 1+1 network, ensure that technicians are available at each end of an optical span as it is upgraded.
- At each Alcatel-Lucent 1665 DMX node connected to the 1+1 network using single-rate pluggable transmission modules, 2 replacement upgrade pluggable transmission modules.

  The replacement pluggable transmission modules *must* have compatible optics. For example, do *not* replace a pluggable transmission modules that has long reach optics with a pluggable transmission modules that has intermediate reach optics. Refer to *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.

  Important! Release 9.0 or later software is required to support the 1+1 network upgrade.

  Important! All nodes in the existing network must have the same software release before upgrading the network.



NOTICE

Service-disruption hazard

Removing or installing pluggable transmission modules during a System Reset can cause system errors.

Do not remove or install a pluggable transmission module during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the pluggable transmission module.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.
3. Review the applicable office records for each fiber span in the 1+1 network and the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for detailed SONET optical specifications of the pluggable transmission modules. Ensure that the upgrade pluggable transmission modules are compatible with each fiber span in the 1+1 network. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Applications and Planning Guide, 365-372-324*.
4. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description* .
5. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this upgrade procedure.
6. Determine the local operating procedures for removing a pluggable transmission module. Local operating procedures for removing a pluggable transmission module may vary. One method is to disconnect the optical fibers and remove the pluggable transmission module. Another method is to verify the port active/standby status, perform manual switches if the port is active, and then disconnect the optical fibers and remove the pluggable transmission module.
7. At nodes upgraded to the OC-48 rate, select **View** → **Equipment** to access the required circuit pack and verify that the port and port grouping will support the upgrade to the OC-48 rate. Only the first port in the port grouping supports the OC-48 rate. The remaining ports in the port grouping must be unavailable. When the first port in a port group is provisioned to OC-48, the other ports become unavailable. If the OC-12 port to be upgraded is not the first port in the port grouping or other ports

in the port grouping are carrying service, the service must be moved before performing this upgrade procedure. To move service to another port pair refer to Procedure 12-5.2: "Upgrade low-speed OC-12 UPSR connections at node with single-rate circuit packs" (p. 12-106). For more information about port groupings, refer to Procedure 4-15: "Install pluggable transmission modules" (p. 4-76).

Steps

Important! When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to upgrade an in-service 1+1 network.

1 From office records and work instructions, determine the current 1+1 network configuration. Note how the nodes are connected in the 1+1 network and make a drawing of the 1+1 network to reference during this upgrade procedure.

Reference: Refer to the "1+1 network configuration examples" (p. 12-655) at the end of the procedure.

2 Identify and log in to an Alcatel-Lucent 1665 DMX node in the 1+1 network to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble-clearing procedures to clear all existing alarms before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

4 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

5 **Important!** Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support test access.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

6 Log in to the other node in the 1+1 network and repeat Step 3 through Step 5. Then continue with the next step.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

7 

NOTICE

Service-disruption hazard

If spanning tree is used for protection on the network being upgraded, this upgrade could cause Ethernet traffic loss when the spanning tree switches to a new topology.

Ensure that the spanning tree is configured correctly.

Important! Alcatel-Lucent 1665 DMX and Alcatel-Lucent 1665 DMXtend support Ethernet service with spanning tree protection.

If Ethernet service is provisioned with spanning tree protection, verify that the existing spanning tree configuration is correct.

Reference: Procedure 12-35.2: “Verify spanning tree configuration” (p. 12-659)

8 Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network to be upgraded.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

9 **Important!** The Ring Upgrade Mode is required to allow ports in the protected port pair to be independently reprovisioned and operate at different rates.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to “Ring Upgrade Mode” (p. 12-639).

10 If required, verify the active/standby status of the original port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-35.1: “Verify active/standby status of port to be upgraded” (p. 12-658)

11 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the port is upgraded at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required original port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the upgrade rate and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network. 2. Disconnect the optical fibers from the original pluggable transmission module in Main/Function/Growth slot 1. 3. Replace the original pluggable transmission module in Main/Function/Growth slot 1 with the upgrade pluggable transmission module. **Result:** The upgrade pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
multirate pluggable transmission module,	Select **Configuration** → **Equipment** and expand the port in Main/Function/Growth slot 1. Click on the required original port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the upgrade rate and click **Apply**. **Result:** The system reports an `inc. LOF` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

12 Identify and log in to the far-end Alcatel-Lucent 1665 DMX node in the 1+1 network to be upgraded.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

13 **Important!** The Ring Upgrade Mode is required to allow ports in the protected port pair to be independently reprovisioned and operate at different rates.

At the *WaveStar*® CIT System View, select **Configuration** → **Ring Upgrade Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Ring Upgrade Mode. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate and the *WaveStar*® CIT Alarm List shows the Ring Upgrade Mode as Not Alarmed.

For more information about the Ring Upgrade Mode, refer to "Ring Upgrade Mode" (p. 12-639).

14 If required, verify the active/standby status of the original port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-35.1: “Verify active/standby status of port to be upgraded” (p. 12-658)

15 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required original port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the upgrade rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a single-rate pluggable transmission module,	The system reports an `inc. LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the upgraded optical span.

16 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate pluggable transmission module in Main/Function/Growth slot 1. Then replace the single-rate pluggable transmission module in Main/Function/Growth slot 1 with the upgrade pluggable transmission module.

Result: The upgrade pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

17 If required at both ends of the optical span to be upgraded, perform the following to connect the upgrade pluggable transmission module in Main/Function/Growth slot 1 and the required port at the opposite end of the upgraded optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.)
3. Clean and connect the receive fibers.

Result: The `inc. LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

18 If required, verify the active/standby status of the original port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-35.1: "Verify active/standby status of port to be upgraded" (p. 12-658)

19 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required original port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the upgrade rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
multirate pluggable transmission module,	The system reports an `inc. LOF` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

20 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the port is upgraded at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate pluggable transmission module in Main/Function/Growth slot 2 with the upgrade pluggable transmission module.

Result: The upgrade pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

If the upgraded port in Main/Function/Growth slot 2 is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

21 Log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network to be upgraded.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

22 If required, verify the active/standby status of the original port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-35.1: “Verify active/standby status of port to be upgraded” (p. 12-658)

23 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required original port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the upgrade rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a single-rate pluggable transmission module,	The system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the upgraded optical span.

24 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate pluggable transmission module in Main/Function/Growth slot 2 with the upgrade pluggable transmission module.

Result: The upgrade pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

25 If required at both ends of the optical span to be upgraded, perform the following to connect the upgrade pluggable transmission module in Main/Function/Growth slot 2 and the required port at the opposite end of the upgraded optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.)
3. Clean and connect the receive fibers.

Result: The `inc. LOS` alarms clear. Transmission is now supported on the upgraded optical span.

Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

26 **Important!** At nodes connected to the 1+1 network, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the 1+1 network, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

27 **Important!** The 1+1 network must be alarm free with normal transmission before manually provisioning the nodes back to the Normal mode. After a node is manually provisioned back to the Normal mode, the node can *not* be returned to the pre-upgrade state using the backout procedure.

At each node connected to the 1+1 network, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

28 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the upgrade ports. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

At each node in the 1+1 network, back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

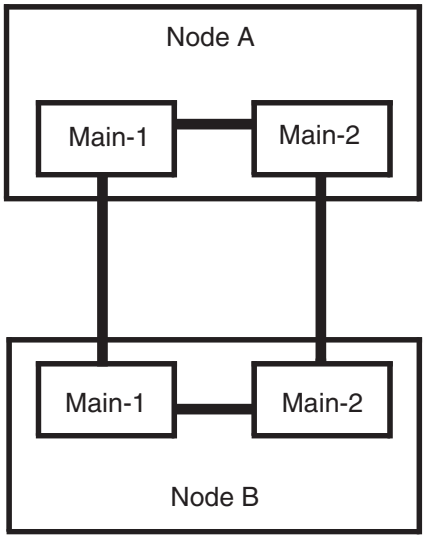
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)
- Procedure 2-10: “Backup and restore NE database via FTP” (p. 2-155)
- Procedure 2-11: “Backup and restore NE database via FTTD” (p. 2-167)
- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)

END OF STEPS

1+1 network configuration examples

Nodes connected to the 1+1 network using the Main Slots

Figure 12-18 Nodes connected using Main slots



main-main

Figure 12-19 Nodes connected using Main slots and Function/Growth slots

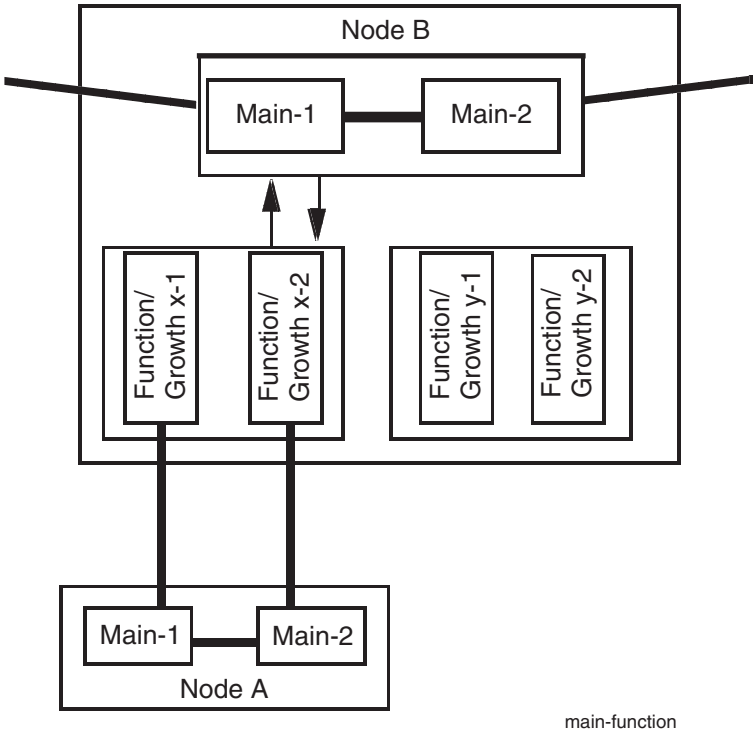
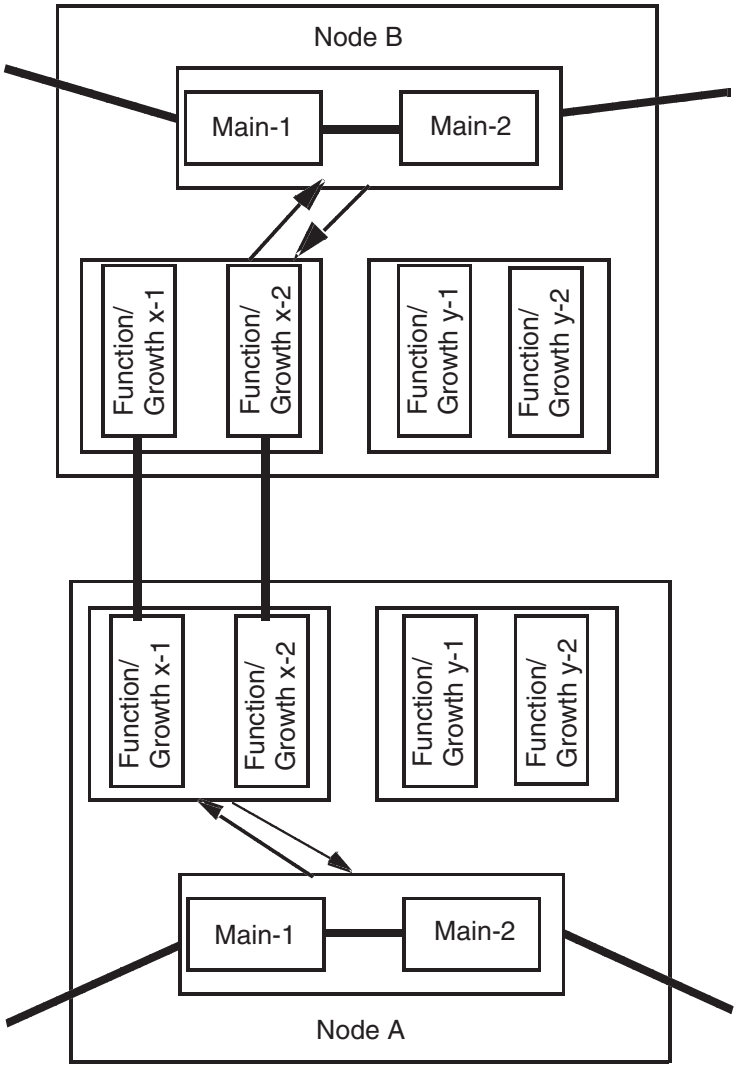


Figure 12-20 Nodes connected using Function/Growth slots



function-function

Procedure 12-35.1: Verify active/standby status of port to be upgraded

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the port to be upgraded and perform manual switches to switch traffic away from an active port.

1 **Important!** If the port to be upgraded is the active port for transmission and the port is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the port to be upgraded.

Select **View** → **Protection** to access the required protection group (according to the work instructions) and determine if the port to be upgraded is active for transmission. Record the active paths supported by the port to be upgraded. Click **Close**.

2 **Important!** If the port to be upgraded is active for transmission, optional manual switches can be performed before upgrading the port. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the port to be upgraded is *not* active for transmission, proceed to Step 3.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

The system reports a `manual switch` condition for the affected line.

3 If required, repeat Step 1 to verify that the port to be upgraded is *not* the active port for transmission.

STOP! *To complete the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-35.2: Verify spanning tree configuration

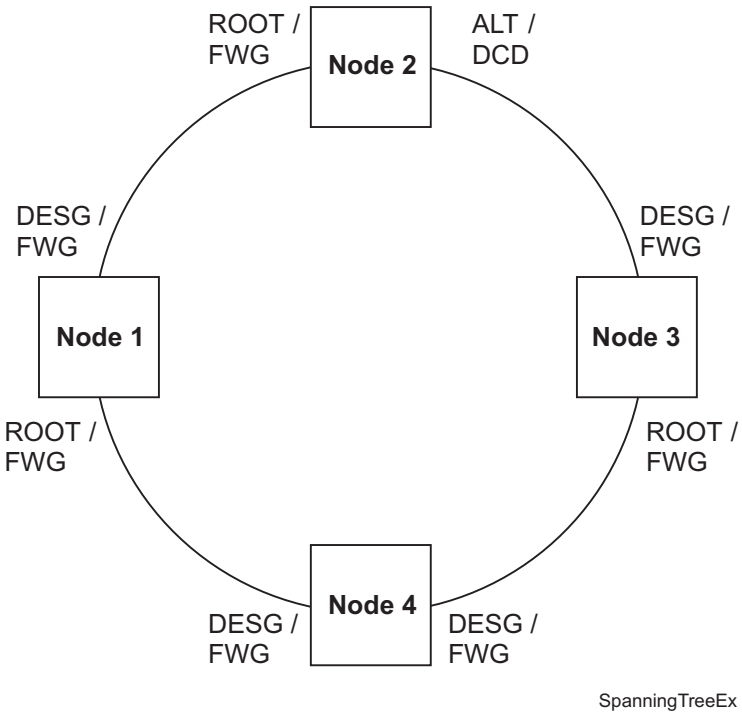
Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Use this procedure to verify the spanning tree configuration.

Spanning tree network example

The following figure shows an example of a simple spanning tree network in a ring configuration with the spanning tree role and spanning tree status of each participating port.



The spanning tree role values are:

- ROOT - Port is used for transmission and is the best path to the root node
- DESG (Designated) - Port is used for transmission; however, the port is not the best path to the root node
- ALT (Alternate) - Port is not used for transmission

The spanning tree status values are:

- FWG: Forwarding
- BLK: Blocked - 802.1D mode only
- LLG: Learning/Listening
- DISA: Disabled - Administration
- DISF: Disabled - Failure
- DCD: Discarding - 802.1w mode only

In this example, Node 4 is elected the *root node* by the spanning tree protocol. The root node can be identified by observing the spanning tree role of the participating ports. At the root node, all the participating ports have a spanning tree role of either DESG (designated) or ALT (alternate). The participating ports at the root node do *not* have a spanning tree role of ROOT.

Because there is a transmission loop in the example spanning tree network, the spanning tree role of a port at Node 2 is ALT (alternate) and the port is not used for transmission.

The spanning tree role of the remaining participating ports in the example is DESG (designated).

In this example, all ports have a FWG (forwarding) spanning tree status, except for the ALT port at Node 2. The ALT port has a DCD (discarding) or BLK (blocked) spanning tree status.

Steps

Complete the following steps to verify the spanning tree configuration.

1 Using office records and the work instructions determine the affected Ethernet spanning tree networks to be verified. Make a sketch of each spanning tree network with all participating nodes/ports using Rapid Spanning Tree Protocol and their connectivity.

Reference: Refer to the example in "Spanning tree network example" (p. 12-659).

2 Identify a spanning tree network to be verified.

3 At each node in the spanning tree network, select **View** → **Data** → **Spanning Tree Group** to access the required spanning tree group and record the required *Port Role* and *Status* parameter values for the participating ports.

4 **Important!** There must be exactly one root node in the spanning tree network. At the root node, all the participating ports have a *Port Role* of either DESG (designated) or ALT (alternate). None have ROOT.

Using the information obtained in the previous step, determine the root node by observing the *Port Role* of the participating ports at each node.

5 For all nodes except the root node, verify that each node has one participating port with a *Port Role* of ROOT.

6 Verify the appropriate forwarding status of the remaining ports.

If...	Then...
a ring network	verify that exactly one port has a *Port Role* of ALT with a *Status* of DCD or BLK. No port should have a *Status* of DISF or DISA.
a mesh network where there may be multiple redundant paths (loops),	verify that there are exactly enough ports with a *Port Role* of ALT and a *Status* of DCD or BLK to break all loops but still allow a path from every other node to the root node. No port should have a *Status* of DISF or DISA.

7 If any port has a *Status* of DISF or DISA, clear all Ethernet-related alarms/conditions and/or verify provisioning using office records.

If required, change the existing spanning tree configuration.

Reference:

- Procedure 11-26: “Change an existing spanning tree configuration” (p. 11-230)
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

If required, contact Technical Support Services (TSS) for assistance in changing the spanning tree configuration.

8 If required, repeat this procedure from Step 2 to verify another spanning tree network.

END OF STEPS

Procedure 12-36: Back out 1+1 network upgrade (multirate circuit packs)

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the 1+1 network must be in the provisioned Ring Upgrade Mode.

Use this procedure to back out an 1+1 network upgrade where the near-end and far-end nodes are connected to the 1+1 network using multirate circuit packs.

Backing out of an upgrade in progress returns *all* nodes in the 1+1 network to their pre-upgrade state.

To temporarily stop the upgrade refer to Procedure 12-37: “Suspend UPSR/1+1 upgrade at node (multirate circuit packs)” (p. 12-679).

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Optical power meter
- Wrist strap
- Original single-rate pluggable transmission modules for the near-end and far-end nodes
- As the upgrade is backed out around the 1+1 network, ensure that technicians are available at each end of an optical span as the upgrade is backed out.



NOTICE

Service-disruption hazard

Removing or installing pluggable transmission modules during a System Reset can cause system errors.

Do not remove or install a pluggable transmission module during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the pluggable transmission module.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this backout procedure. If required, refer to the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Software Release Description*.
3. If required, review the *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) User Operations Guide, 365-372-325* for procedures or cautions that may apply to this backout procedure.
4. Determine the local operating procedures for removing a pluggable transmission module. Local operating procedures for removing a pluggable transmission module may vary. One method is to disconnect the optical fibers and remove the pluggable transmission module. Another method is to verify the port active/standby status, perform manual switches if the port is active, and then disconnect the optical fibers and remove the pluggable transmission module.

Steps

Important! This procedure starts at the last node upgraded.

When optical fibers are disconnected during this procedure, `inc. LOS` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to back out of a 1+1 network upgrade.

1 From office records and work instructions, determine the network configuration and current status of the upgrade.

2 Identify the last node that was upgraded.

If the last node upgraded is...	Then...
the near-end Alcatel-Lucent 1665 DMX node (starting node) and the 1+1 network upgrade is complete (all nodes connected to the 1+1 network are in the Ring Upgrade Mode),	Identify and log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network and continue with the next step.
not the near-end Alcatel-Lucent 1665 DMX node (starting node) and both Main/Function/Growth slots have been upgraded,	Log in to the last node upgraded and proceed to Step 6.

If the last node upgraded is...	Then...
not the near-end Alcatel-Lucent 1665 DMX node (starting node) and only Main/Function/Growth slot 1 has been upgraded,	Log in to the last node upgraded and proceed to Step 10.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

3 If required, verify the active/standby status of the upgrade port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-36.1: "Verify active/standby status of port to be backed out" (p. 12-677)

4 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the port is backed out at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate pluggable transmission module,	Perform the following: 1. Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required upgrade port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the original rate and click **Apply**. The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network. 2. Disconnect the optical fibers from the upgrade pluggable transmission module in Main/Function/Growth slot 2. 3. Replace the upgrade pluggable transmission module in Main/Function/Growth slot 2 with the original pluggable transmission module. **Result:** The original pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned. The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
multirate pluggable transmission module,	Select **Configuration** → **Equipment** and expand the port in Main/Function/Growth slot 2. Click on the required upgrade port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the original rate and click **Apply**. **Result:** The system reports an `inc. LOF` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

5 Identify and log in to the far-end Alcatel-Lucent 1665 DMX node in the 1+1 network to be backed out.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

6 If required, verify the active/standby status of the upgrade port on the multirate circuit pack in Main/Function/Growth slot 2 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-36.1: "Verify active/standby status of port to be backed out" (p. 12-677)

7 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required original port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the original rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a single-rate pluggable transmission module,	The system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the original optical span.

8 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the upgrade pluggable transmission module in Main/Function/Growth slot 2. Then replace the upgrade pluggable transmission module in Main/Function/Growth slot 2 with the original pluggable transmission module.

Result: The original pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

9 If required at both ends of the optical span to be backed out, perform the following to connect the original pluggable transmission module in Main/Function/Growth slot 2 and the required port at the opposite end of the original optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.)
3. Clean and connect the receive fibers.

   Result: The `inc. LOS` alarms clear. Transmission is now supported on the original optical span.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

10 If required, verify the active/standby status of the upgrade port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-36.1: "Verify active/standby status of port to be backed out" (p. 12-677)

11 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required upgrade port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the original rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module,	The system reports an `inc. LOF` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

12 **Important!** Do not reconnect the optical fibers until instructed to do so. The optical fibers are reconnected after the port is backed out at each end of the optical span.

If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the upgrade pluggable transmission module in Main/Function/Growth slot 1. Then replace the upgrade pluggable transmission module in Main/Function/Growth slot 1 with the original pluggable transmission module.

Result: The original pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

If the original port in Main/Function/Growth slot 1 is equipped with a multirate pluggable transmission module, `inc. LOF` alarms are reported.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

13 Log in to the near-end Alcatel-Lucent 1665 DMX node (starting node) in the 1+1 network to be backed out.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

14 If required, verify the active/standby status of the upgrade port on the multirate circuit pack in Main/Function/Growth slot 1 and perform manual switches to switch traffic away from an active port.

If the working card (slot 1 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Protection" Switch Type and click **Apply**.

If the protect card (slot 2 card) is to be upgraded and is active, perform an optional manual transmission switch.

1. Select **Fault** → **Protection Switch**.
2. Select the required 1+1 Line and click **Select**.
3. Select the "Manual to Working" Switch Type and click **Apply**.

Reference: Procedure 12-36.1: “Verify active/standby status of port to be backed out” (p. 12-677)

15 Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 1. Click on the required upgrade port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to the original rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 1 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a single-rate pluggable transmission module,	The system reports an `inc. LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.
multirate pluggable transmission module and the opposite end of the upgraded optical span is equipped with a multirate pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the original optical span.

16 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the upgrade pluggable transmission module in Main/Function/Growth slot 1. Then replace the upgrade pluggable transmission module in Main/Function/Growth slot 1 with the original pluggable transmission module.

Result: The original pluggable transmission module in Main/Function/Growth slot 1 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 1 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 1. Alarms may also be reported at other nodes in the network.

Reference: Procedure 4-15: “Install pluggable transmission modules” (p. 4-76)

17 If required at both ends of the optical span to be backed out, perform the following to connect the original pluggable transmission module in Main/Function/Growth slot 1 and the required port at the opposite end of the original optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.)
3. Clean and connect the receive fibers.

   Result: The `inc. LOS` alarms clear. Transmission is now supported on the original optical span.

   Reference: Procedure 14-4: “Perform connection and verification of optical facility” (p. 14-47)

18 **Important!** At nodes connected to the 1+1 network, the system reports the `ring upgrade mode` standing condition (not alarmed) in the *NE Alarm List* until the node is manually provisioned back to the Normal mode.

At nodes connected to the 1+1 network, click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms or standing conditions are present (except `ring upgrade mode` and `ABN condition`).

Refer to the appropriate trouble-clearing procedures to clear all existing alarms and standing conditions (except `ring upgrade mode` and `ABN condition`) before continuing with this procedure.

Reference:

- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*
- *Alcatel-Lucent 1665 Data Multiplexer Extend (DMXtend) Alarm Messages and Trouble Clearing Guide, 365-372-326*

19 **Important!** This completes the backout procedure, except for taking the nodes connected to the 1+1 network out of the Ring Upgrade Mode. The decision to take these nodes out of the Ring Upgrade Mode or leave them depends on the reason the back out was necessary, and what is required before again starting the upgrade. In the Ring Upgrade Mode, cross-connections cannot be created or removed.

If required at each node connected to the 1+1 network, select **Configuration** → **Normal Mode**.

Result: A dialog box appears asking you to confirm changing the NE Mode to Normal mode. Click **Yes**.

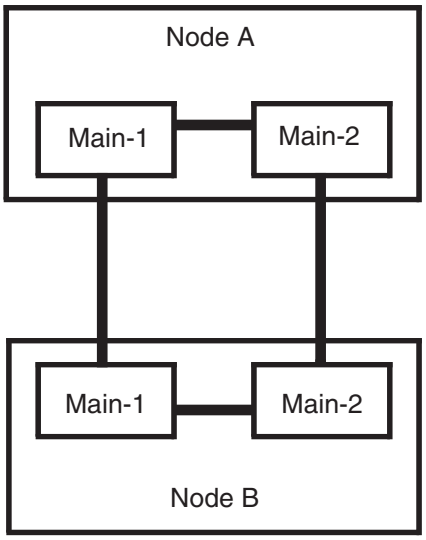
The **ABN** LED is turned off on the SYSCTL circuit pack faceplate and the Ring Upgrade Mode will be removed from the *WaveStar*® CIT alarm list.

END OF STEPS

1+1 network configuration examples

Nodes connected to the 1+1 network using the Main Slots

Figure 12-21 Nodes connected using Main slots



main-main

Figure 12-22 Nodes connected using Main slots and Function/Growth slots

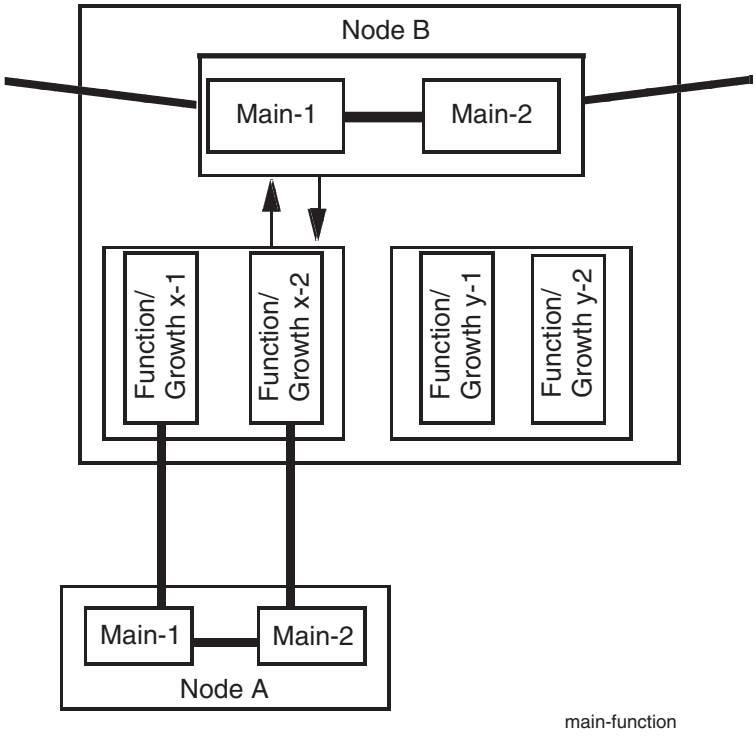
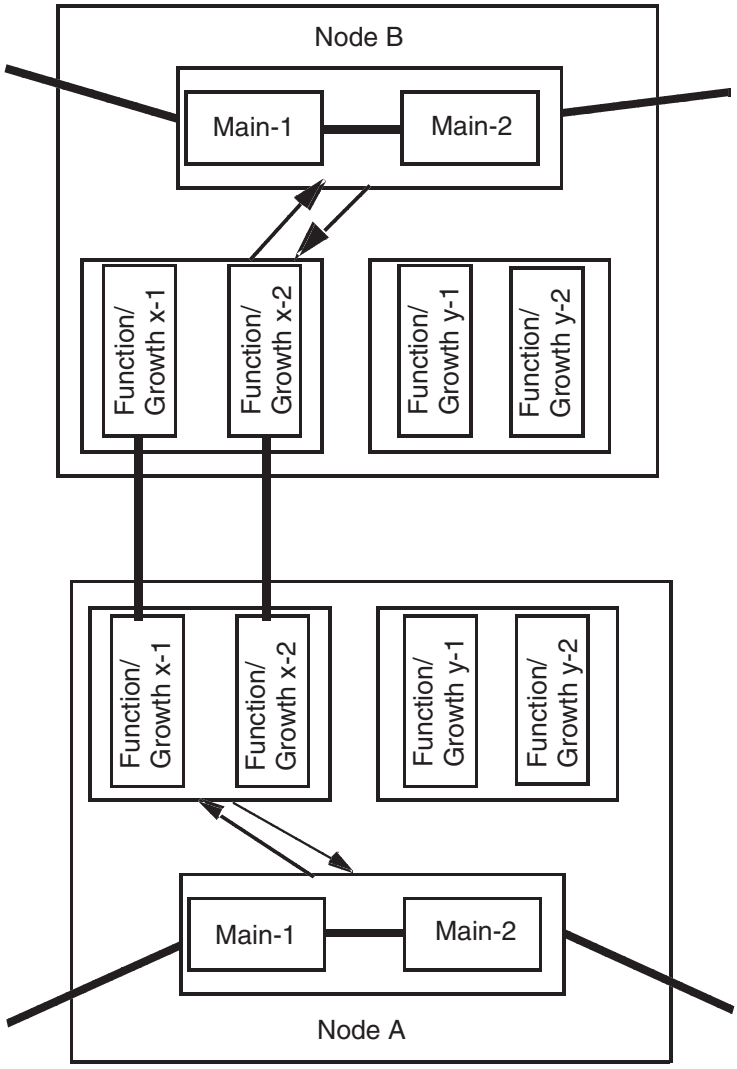


Figure 12-23 Nodes connected using Function/Growth slots



function-function

Procedure 12-36.1: Verify active/standby status of port to be backed out

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by another procedure.

Steps

Important! This procedure is optional.

Complete the following steps to verify the active/standby status of the port to be backed out and perform manual switches to switch traffic away from an active port.

1 **Important!** If the port to be backed out is the active port for transmission and the port is removed, the system performs an automatic protection switch and subsequent transmission hits (less than 60 ms) will occur. If desired, perform this step to determine the transmission state of the port to be backed out.

Select **View** → **Protection** to access the required protection group (according to the work instructions) and determine if the port to be backed out is active for transmission. Record the active paths supported by the port to be backed out. Click **Close**.

2 **Important!** If the port to be backed out is active for transmission, optional manual switches can be performed before backing out the port. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If the port to be backed out is *not* active for transmission, proceed to Step 3.

To perform an optional manual transmission switch, select **Fault** → **Protection Switch**. Select the required *1+1 Line* and click **Select**. Select the *Manual* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The **ABN** LED is lighted on the SYSCTL circuit pack faceplate.

The system reports a `manual switch` condition for the affected line.

3 If required, repeat Step 1 to verify that the port to be backed out is *not* the active port for transmission.

STOP! *To complete backing out the upgrade, return to the procedure that directed you to perform this procedure.*

END OF STEPS

Procedure 12-36.2: Place holder

Steps

1 This is a place holder for a future procedure.

END OF STEPS

Procedure 12-37: Suspend UPSR/1+1 upgrade at node (multirate circuit packs)

Overview



NOTICE

Service-disruption hazard

If a node has been taken out of the Ring Upgrade Mode, the node cannot be returned to the original pre-upgrade state without affecting service.

All nodes connected to the UPSR/1+1 network using single-rate circuit packs in the Main slots and multirate circuit packs in the Main/Function/Growth slots must be in the provisioned Ring Upgrade Mode.

Important! This procedure starts at the last node upgraded. The last node upgraded must be connected to the UPSR/1+1 network using single-rate circuit packs in the Main slots or multirate circuit packs in the Main/Function/Growth slots. Suspending an upgrade at a node connected to the UPSR/1+1 network using port pairs on a single-rate circuit pack in the Function/Growth slots is *not* supported.

This procedure assumes that the last node upgraded is a Alcatel-Lucent 1665 DMX node connected to the UPSR/1+1 network using multirate circuit packs in the Main/Function/Growth slots. If the upgrade is suspended at a node connected to the UPSR/1+1 network using single-rate circuit packs, refer to the appropriate suspend procedure for the upgrade being performed.

Use this procedure to temporarily suspend a UPSR/1+1 network upgrade at a Alcatel-Lucent 1665 DMX node with multirate circuit packs in the Main/Function/Growth slots.

Suspending an upgrade in progress *temporarily* stops the upgrade.

To return all nodes in the ring to their pre-upgrade state, refer to the appropriate backout procedure for the upgrade being performed.

When a USPR/1+1 network upgrade is temporarily suspended before completion, some spans are operating at the upgrade line rate and some at the original line rate. This requires two nodes that are equipped with the upgrade circuit pack/port in one Main/Function/Growth slot and the original circuit pack/port in the other Main/Function/Growth slot. These nodes are the starting node and the last node upgraded. These nodes must be connected to the UPSR/1+1 network using single-rate circuit packs in the Main slots or multirate circuit packs in the Main/Function/Growth slots. Suspending an upgrade at a node connected to the UPSR/1+1 network using port pairs on single-rate circuit packs in the Function/Growth slots is *not* supported.

To continue to operate temporarily with different line rates in Main/Function/Growth slots, the starting node and the nodes that have been upgraded must remain in the Ring Upgrade Mode.

Privilege level

You must log in as a Privileged user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Original single-rate pluggable transmission module



NOTICE

Service-disruption hazard

Removing or installing pluggable transmission modules during a System Reset can cause system errors.

Do not remove or install a pluggable transmission module during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the pluggable transmission module.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this suspend procedure.

Steps

Important! This procedure starts at the last node upgraded. This procedure assumes that the last node upgraded is a Alcatel-Lucent 1665 DMX node connected to the UPSR/1+1 network using multirate circuit packs in the Main/Function/Growth slots.

When optical fibers are disconnected during this procedure, `inc. LOS`, `section DCC channel failed`, and `neighbor SYSCTL CP unavailable` alarms are reported. The `holdover mode active` condition may also be reported depending on the provisioned system timing mode.

Complete the following steps to temporarily suspend an UPSR/1+1 network upgrade at a Alcatel-Lucent 1665 DMX using multirate circuit packs..

1 Identify the last node that was upgraded.

If...	Then...
both Main/Function/Growth slots have been upgraded,	Log in to the last node upgraded and continue with the next step.
only one Main/Function/Growth slot has been upgraded,	Main/Function/Growth slot 1 has been upgraded. Transmission is now supported on the upgraded optical span. The node is already in the proper suspend configuration and no further action is required. **STOP!** End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes. To resume the upgrade, reprovision the port signal type parameter to the upgrade port rate and replace the single-rate pluggable transmission module (if equipped) in Main/Function/Growth slot 2. Refer to the appropriate procedure for the upgrade being performed. To back out the upgrade, refer to the appropriate procedure for the upgrade being performed.

Reference: Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27)

2 **Important!** Both Main/Function/Growth slots have been upgraded. All traffic is now active on Main/Function/Growth slot 1, and the system is reporting an `inc. LOF` or `inc. LOS` alarm for Main/Function/Growth slot 2.

Select **Configuration** → **Equipment** and expand the circuit pack in Main/Function/Growth slot 2. Click on the required upgrade port and **Select** to obtain the port parameters. Provision the port Signal Type parameter to original port rate and click **Apply**.

Result:

If the multirate circuit pack in Main/Function/Growth slot 2 is equipped with a...	Then...
single-rate pluggable transmission module,	The system reports an `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2. The **FAULT** LED may light on the circuit packs in the Main slots, and the opposite end of the optical spans may report `inc. OCN sig. degrade (BER)` and `section DCC channel failed` alarms. Alarms may also be reported at other nodes in the network.
multirate OC-3/OC-12/OC-48 pluggable transmission module,	The `inc. LOF` alarms clear. Transmission is now supported on the original optical span.

3 **Important!** If the port is active for timing and/or transmission, disconnecting the optical fibers causes timing and/or transmission switches. Transmission hits (less than 60 ms) will occur for each separate protection switch.

If required, disconnect the optical fibers from the single-rate upgrade pluggable transmission module in Main/Function/Growth slot 2. Then replace the single-rate upgrade pluggable transmission module in Main/Function/Growth slot 2 with the original pluggable transmission module.

Result: The original pluggable transmission module in Main/Function/Growth slot 2 is tested and autoprovisioned.

The `unexpected or failed Pluggable Transmission Module` alarm for Main/Function/Growth slot 2 clears, and the system reports an `inc. LOS` alarm for Main/Function/Growth slot 2. Alarms may also be reported at other nodes in the ring.

Reference: Procedure 4-15: "Install pluggable transmission modules" (p. 4-76)

4 If required at both ends of the optical span to be upgraded, perform the following to connect the original pluggable transmission module in Main/Function/Growth slot 2 and the required circuit pack/port at the opposite end of the original optical span:

1. Clean and connect the transmit optical fibers.
2. Measure the optical receive power of the receive fibers using an optical power meter. Select the appropriate LBO to attenuate the receive signal to the middle of the allowable optical receive power range. (Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for the SONET optical specifications.)
3. Clean and connect the receive fibers.

   Result: The `inc. LOS` alarms clear. Transmission is now supported on the original optical span.

   Reference: Procedure 14-4: "Perform connection and verification of optical facility" (p. 14-47)

   STOP! End of Procedure. The upgrade procedure is now temporarily suspended and traffic is supported to the adjacent nodes.

   To resume the upgrade, reprovision the port signal type parameter to the upgrade port rate and replace the single-rate pluggable transmission module (if equipped) in Main/Function/Growth slot 2. Refer to the appropriate procedure for the upgrade being performed.

   To back out the upgrade, refer to the appropriate procedure for the upgrade being performed.

END OF STEPS

Procedure 12-38: Upgrade low-speed LNW7 to LNW801 circuit packs

Overview

Use this procedure to upgrade an LNW7 28DS1PM to a high-density LNW801 56DS1/E1.

Important! The high-density circuit packs are only compatible with the Alcatel-Lucent 1665 DMX High Capacity Shelf (DMX-HC-20A, DMX-HC-30A, or DMX-HC-30A-CE Shelf Type). The standard Alcatel-Lucent 1665 DMX Shelf does not support the high-density circuit packs. If a high-density circuit pack is installed in the standard Alcatel-Lucent 1665 DMX Shelf, the system will not recognize the circuit pack as an allowable type.

To determine the shelf type, select **View** → **Equipment**, highlight *Shelf*, and click **Select** to obtain the shelf details.

Important! An upgrade from an LNW7 to an LNW801 is denied if any of the following situations occur:

- Available VT resources are not sufficient to support the cross-connections to the LNW801.
- The upgrade would result in a source and destination conflict of VT bandwidth. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300* for more information about the assignment of VT bandwidth.
- One or more of the LNW6 or LNW7 tributaries is cross-connected only as the source of a cross-connection

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Required equipment

The following equipment is required to perform this procedure:

- Wrist strap
- Two replacement high-density LNW801 circuit packs for each Function unit to be upgraded.

Release 9.1 or later software is required to support LNW7 28DS1PM to high-density LNW801 56DS1/E1 upgrade.



NOTICE

Equipment damage hazard

Rocking circuit packs back and forth when removing or installing them can damage circuit pack and/or shelf connectors.

Do not rock circuit packs back and forth when removing or installing them. Carefully slide circuit packs into or out of the shelf slot.



NOTICE

Service-disruption hazard

Removing or installing circuit packs during a System Reset can cause system errors.

Do not remove or install a circuit pack during a System Reset. If a System Reset occurs, wait until the System Reset is complete, then remove or install the circuit pack.

Before you begin

Prior to performing this procedure:

1. Refer to "Electrostatic discharge" (p. 1-26) information in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure, and verify that the affected circuit pack/protection group AIDs are specified.
3. Verify that the circuit packs to be upgraded are protected. Both Function unit slots in a group(**A**,**B**,**C**,**D**)**1** and (**A**,**B**,**C**,**D**)**2** must be equipped before performing this procedure. If necessary, install the companion circuit pack. Refer to Procedure 4-8: "Install DS1/E1 circuit packs" (p. 4-47).
4. Verify that the DS1 cables necessary to support the high-density circuit packs have already been installed. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304* for cabling information.
5. Review the applicable *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for any detailed procedures or cautions that may apply to this upgrade procedure.

Steps

Complete the following steps to upgrade the in-service low-speed electrical circuit packs in a function unit.

1 Click the **Alarm List** button in the top right corner of the System View to view the *NE Alarm List* and verify that no alarms are present.

Refer to the appropriate trouble clearing procedures to clear all existing alarms before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

2 To verify that no loopbacks, protection switch lockouts, or protection switches are present, select **View** → **Rolling Events**. Under the line reading `RTRV-COND-ALL` determine if any loopbacks, protection switch lockouts, or protection switches are displayed.

Remove all existing loopbacks, protection switch lockouts, or protection switches before continuing with this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

3 Select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and verify that no test access sessions exist.

If required, select **Fault** → **Analysis** → **Test Access** to access the *Test Access Wizard* and delete all existing test access sessions.

Reference:

- Procedure 14-27: “View test access sessions” (p. 14-136)
- Procedure 14-26: “Delete test access session” (p. 14-135)

4 **Important!** When the standard density DS1 circuit pack in slot (**A**, **B**, **C**, **D**) **2** is removed, transmission hits occur causing the system to report the `inc. (from DSX) DS1 sig. failed` condition. Depending on the provisioned value of the DS1 port *Signal Failure Threshold*, it may take up to 20 minutes for the `inc. (from DSX) DS1 sig. failed` condition to automatically clear. It is recommended that the DS1 port *Signal Failure Threshold* be provisioned *10E-3* to minimize the time it takes the system to clear the condition. The original DS1 port *Signal Failure Threshold* can be reprovisioned when the upgrade is complete.

From System View select **Reports** → **Equipment Lists** → **Port**. Click on the DS1 circuit pack in slot (**A**,**B**,**C**,**D**)**2** and **Select**. Record the *Signal Failure Threshold* of each DS1 port. If required, provision the *Signal Failure Threshold* of the DS1 ports to *10E-3*.

Reference: Procedure 4-9: "Provision DS1/E1 circuit packs/ports for service" (p. 4-50)

5 **Important!** Local operating procedures for removing a circuit pack may vary. One method is to simply remove the circuit pack. Another method is to verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then remove the circuit pack.

Determine the local operating procedures for removing a circuit pack before removing the circuit pack in slot (**A**, **B**, **C**, **D**) **1**.

If the local operating procedures specify...	Then...
remove the circuit pack,	Proceed to Step 8.
verify the circuit pack active/standby status, perform manual switches if the circuit pack is active, and then remove the circuit pack,	Continue with Step 6.

6 **Important!** The circuit pack in slot (**A**, **B**, **C**, **D**) **1** must be replaced first. Perform this step to determine if the circuit pack in slot (**A**, **B**, **C**, **D**) **1** is active for transmission.

From the System View select **Reports** → **Status Lists** → **Pack**. Click on *Shelf* and **Select**. Observe the value of the *Switch State* parameter for the required *fn-{a,b,c,d}-1* circuit pack (according to the work instructions). If the *Switch State* parameter is *active*, the circuit pack in slot (**A**, **B**, **C**, **D**) **1** is the active circuit pack for transmission. Click **Close**.

7 **Important!** This step is optional. If the circuit pack in slot (**A**, **B**, **C**, **D**) **1** is the active circuit pack for transmission, then a manual switch must be performed before replacing the circuit pack.

If the circuit pack in slot (**A**, **B**, **C**, **D**) **2** is the active circuit pack for transmission, do *not* perform this step.

To perform a manual transmission switch, select **Fault** → **Protection Switch**. Click on the required *1+1 Equip* protection group (according to the work instructions) and **Select**. Select the *Manual (Normal)* Switch Type and click **Apply**.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**. Then click **Close**.

8 Replace the circuit pack in slot (**A**, **B**, **C**, **D**) **1** with the replacement high-density circuit pack.

Result: If a circuit pack firmware update is required, the system reports the `Waiting for Download` and `Install Program IP` slot conditions when the replacement high-density circuit pack is inserted in the slot. After the circuit pack firmware update is complete, the system reports an `unexpected CP type` alarm for slot (**A**, **B**, **C**, **D**) **1**.

If a circuit pack firmware update is not required, the system reports an `unexpected CP type` alarm for slot (**A**,**B**,**C**,**D**)**1** when the replacement high-density circuit pack is inserted.

9



NOTICE

Service-disruption hazard

Following the execution of the system update, transmission is interrupted until the LNW7 in slot 2 is removed.

It is imperative that the user remove the LNW7 as soon as the LNW801 becomes the expected pack type.

Important! The **UPD/INIT** button does not work during this upgrade.

From the System View select **Configuration** → **Update System** → **Update All**.

The service-affecting LNW7 to LNW801 upgrade completes only when the user selects the *FRCD* mode.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes**.

The replacement high-density circuit pack in slot (**A**, **B**, **C**, **D**) **1** is autoprovisioned, and the system performs an automatic circuit pack protection switch. Traffic is automatically switched from the circuit pack in slot (**A**, **B**, **C**, **D**) **2**, to the circuit pack in slot (**A**, **B**, **C**, **D**) **1**.

If upgrading DS1 circuit packs, transmission hits (up to 130 ms) occur as the automatic switches are performed.

All traffic is now active on the circuit pack in slot (**A**, **B**, **C**, **D**) **1**.

The `unexpected CP type` alarm for slot (**A**, **B**, **C**, **D**) **1**, clears, and the system reports an `CP not allowed - eqpt` alarm for slot (**A**, **B**, **C**, **D**) **2**.

10 **Important!** When a standard density LNW7 28DS1PM circuit pack is removed from slot (**A**, **B**, **C**, **D**) **2**, transmission hits occur causing the system to report and automatically clear the `inc. (from DSX) DS1 sig. failed` condition.

Replace the other circuit pack in the companion slot (**A**, **B**, **C**, **D**) **2** with the replacement high-density circuit pack.

Result: The replacement high-density circuit pack in slot (**A**, **B**, **C**, **D**) **2** is autoprovisioned and all alarms clear.

11 From the System View select **View** → **Refresh System View** to update the graphical circuit pack and port information currently displayed for the network element.

Result: A warning message appears asking you to confirm executing this command. Click **Yes**.

The graphical circuit pack and port information displayed in the System View is updated to show the replacement high-density circuit packs and additional ports.

12 If required, provision the *Signal Failure Threshold* of the DS1 ports to the original values recorded in Step 4.

Reference: Procedure 4-9: "Provision DS1/E1 circuit packs/ports for service" (p. 4-50)

13 This completes the low-speed electrical circuit pack upgrade in a Function unit. If the low-speed electrical circuit packs in other Function units are to be upgraded at this node, repeat Step 4 through Step 12; otherwise, continue with the next step.

14 **Important!** It is recommended that the network element database be backed up to a remote OS (for example, OMS) after an upgrade. This creates a current backup copy that includes the replacement circuit packs. The remote OS could use this backup copy to restore the network element database in the event of a catastrophic failure. Attempts to restore the network element database using a backup copy created prior to the upgrade may result in circuit pack failures.

Back up the network element database using the **Configuration** → **Software** → **Remote Backup** command.

Reference:

- Procedure 2-10: "Backup and restore NE database via FTP" (p. 2-155)
- Procedure 2-11: "Backup and restore NE database via FTTD" (p. 2-167)

- Procedure 2-12: “Backup and restore NE database via FTAM” (p. 2-182)
- Procedure 2-9: “Backup and restore NE database using SFTP” (p. 2-144)

END OF STEPS

13 Routine maintenance procedures

Overview

Purpose

This chapter includes maintenance procedures, for example, replacing a fan filter and replacing a shelf.

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Before you begin

Before you begin

Prior to performing all procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Procedure 13-1: Replace fan filter

Overview

Use this procedure to replace a fan filter.

Important! In central office applications, the fan shelf must equipped with a fan filter. To keep the fan shelf operating properly, it is recommended that users routinely change the fan filter every 6 to 9 months.

In outside plant (OSP) applications, remove the fan filter. Operating Alcatel-Lucent 1665 DMX in an OSP without the fan filter improves air flow and therefore enhances cooling performance and extends the life of the equipment.

Required equipment

The following equipment is required:

- Wrist strap
- A replacement filter
  - For Alcatel-Lucent 1665 DMX Comcode: 408 456 770
  - For Alcatel-Lucent 1665 DMX High Capacity shelf Comcode: 408 682 615

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 13-2) in this chapter
2. Refer to “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”
3. Ensure that the replacement fan filter is the same type as the original fan filter.
4. Note that the Standard Shelf is Discontinued Availability effective 6/30/04.

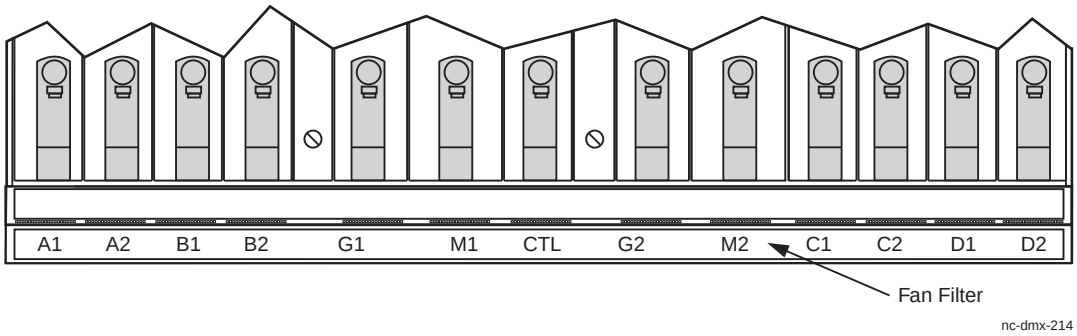
Steps

Complete the following steps to replace the fan filter.

1 Remove the fan filter by pulling it towards you.

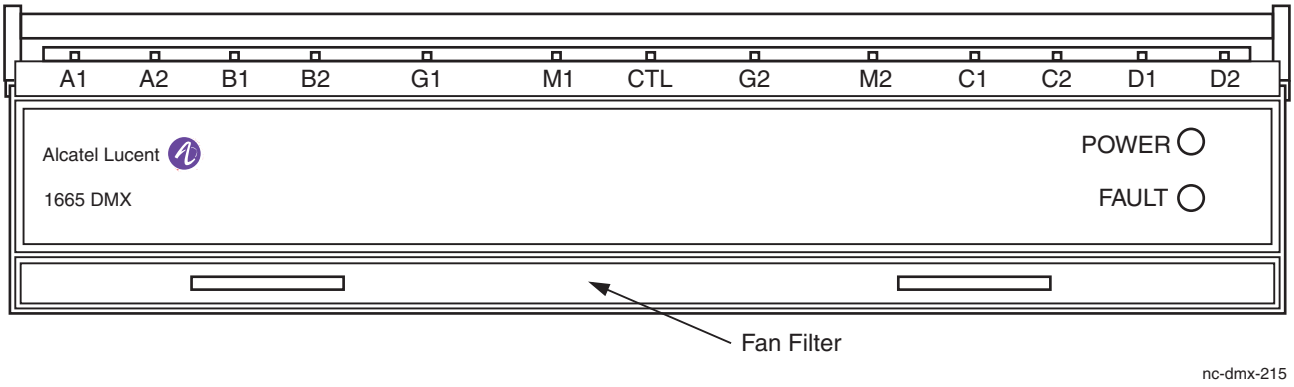
In the Alcatel-Lucent 1665 DMXstandard shelf, the fan shelf is installed above the shelf. However, fan filter is located below the shelf, under the Alcatel-Lucent 1665 DMX fiber tray, refer toFigure 13-1, “Alcatel-Lucent 1665 DMX standard shelf fan filter” (p. 13-4).

Figure 13-1 Alcatel-Lucent 1665 DMX standard shelf fan filter



In the Alcatel-Lucent 1665 DMX High Capacity shelf, the fan shelf is installed below shelf. The fan filter is located directly below the fan shelf, refer toFigure 13-2, “Alcatel-Lucent 1665 DMX High Capacity shelf fan filter” (p. 13-4).

Figure 13-2 Alcatel-Lucent 1665 DMX High Capacity shelf fan filter



2 Install new filter into the fan filter slot.

END OF STEPS

Procedure 13-2: Replace Alcatel-Lucent 1665 DMX standard shelf

Overview

Use this procedure to replace the Alcatel-Lucent 1665 Data Multiplexerstandard shelf (C848540464). The standard shelf has a separate fan shelf. The High Capacity shelf has an integrated fan shelf.

Note that the Standard Shelf is Discontinued Availability effective 6/30/04.

Important! It is assumed that the Alcatel-Lucent 1665 DMX is out of service. Power to the shelf will be removed in this procedure.

Required equipment

Important! A standard Alcatel-Lucent 1665 DMX shelf can be replaced with either a Standard or High Capacity Alcatel-Lucent 1665 DMX shelf.

The following equipment may be required:

- Replacement Alcatel-Lucent 1665 DMX shelf (Refer to Engineering Drawing ED8C871-10 for a complete list of required cables.)
- If a High Capacity shelf is replacing a Standard shelf the following circuit packs and cables may be required in addition to the shelf
  - If high-density 56DS1/E1 circuit packs (LNW8) are being installed, additional DS1 cabling is required (same as the 28DS1/28DS1PM [LNW6/7]).
  - If high-density 48DS3/EC1 circuit packs (LNW19) are being installed, double-density DS3 cabling is required. The high density circuit packs cannot use the same cables as the 12DS3/EC1 (LNW16) circuit packs.
- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap
- Optical fiber connector dust covers
- Optical circuit pack connector dust covers
- ESD protective bags for temporary storage of circuit packs
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*

If sync cables with molded DB-9 connectors are installed, then two sync cables as follows:

Cable Assembly #	Cable Length (feet)
848839619	50
848839627	100

Cable Assembly #	Cable Length (feet)
848839635	150
848839643	250
848839650	450

Miscellaneous discrete cables as follows:

Cable Assembly #	Cable Length (feet)
848839569	50
848839577	100
848839585	150
848839593	250
848839601	350

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 13-2) in this chapter
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that the Alcatel-Lucent 1665 DMX shelf is out of service.

Steps

Complete the following steps to replace a Alcatel-Lucent 1665 DMX shelf.

1 Remove power to the Alcatel-Lucent 1665 DMX shelf by operating the circuit breakers to the OFF position at the Battery Distribution Fuse Bay (BDFB) in the central office or removing the fuses at the BDFB.

Important! Remove power for both A and B feeders to the shelf.

Result: Both **PWR (A)** and **PWR (B)** LEDs on the front of the shelf extinguish.

Reference: Refer to the user documentation for your BDFB for more information.

2 Disconnect the A and B power connectors from the left and right sides of the Alcatel-Lucent 1665 DMX shelf.

3 Using a voltmeter, measure the voltage on the power cable connectors (looking towards the BDFB) between BAT A and BAT A RTN (red cable).

Result: Voltmeter indicates no voltage.

4 Using a voltmeter, measure the voltage on the power cable connectors (looking towards the shelf's backplane) between BAT B and BAT B RTN (blue cable).

Result: Voltmeter indicates no voltage.

5 On the backplane, label all cables connecting to the Alcatel-Lucent 1665 DMX shelf. These include:

- Fan Shelf Power/Alarm Cable (J15)
- DS1/DS3/EC1/FastE Transmission Cables as equipped (J1, J2, J3, J4, J5, J6, J7, J8)
- IAO LAN (J16)
- Modem cable (J17)
- TL1 Interface Cable (J10)
- Sync Cables (J9 and J14)
- Office Alarm Cable (J12)
- Alarm Mult (J13)
- Miscellaneous (Environmental) Discrete (J11)

6 Remove all cables from the Alcatel-Lucent 1665 DMX shelf backplane. It may be necessary to untie the cables from the cable tie bar.

Important! It is not necessary to disconnect the power cables on the backplane connectors (P15 and P14); they are internal to the shelf that is being removed.

7 On the front of the Alcatel-Lucent 1665 DMX shelf, label all cables connecting to circuit packs. These include:

- Optical Fibers connected to the Main OLIUs (Transmit/Receive)
- Optical Fibers connected to OC3/OC12/OC48 Low Speed OLIUs in Function Slots A, B, C, D and Growth Slots (Transmit/Receive)
- Optical Fibers connected to Gigabit Ethernet Circuit Packs in Function Slots A, B, C, D and Growth Slots (Transmit/Receive)
- LAN cable
- CIT cable

8 Remove all cables from circuit packs in the Alcatel-Lucent 1665 DMX shelf.

9 Place protective dust covers on fiber connections (fibers and circuit packs).

10 Note the position of each circuit pack (Function slot number or Growth slot) for reference when installing the new shelf.

11 Carefully remove the fibers from the Alcatel-Lucent 1665 DMX shelf fiber tray.

12 Disengage and remove each circuit pack and place each in an ESD protective bag.

13 Unscrew the mounting screws that attach the Alcatel-Lucent 1665 DMX shelf to the bay frame and remove the shelf. If your replacement shelf is a Alcatel-Lucent 1665 DMX High Capacity shelf, you must also remove the fan shelf above the standard shelf.

Important! Do not disturb cables associated with other Alcatel-Lucent 1665 Data Multiplexer shelves in the bay or equipment in adjacent bays.

14 Inspect the replacement Alcatel-Lucent 1665 DMX shelf for visible damage including bent or touching backplane pins.

15 Determine the mounting configuration for the Alcatel-Lucent 1665 DMX shelf:

- type of bay frame (23-inch or 19-inch wide)
- mounting position (front or rear)
- position in bay (bottom to top).

Important! The Alcatel-Lucent 1665 DMX shelf is shipped with the mounting brackets positioned for mounting to the rear of a 23-inch wide network bay frame.

The Alcatel-Lucent 1665 DMX shelf mounting brackets may have to be repositioned and remounted, depending on the frame type and mounting position (front or rear).

16 If necessary, reposition the shelf mounting brackets accordingly.

For 23-inch frame, front or rear mounting, refer to Figure 13-3, “Alcatel-Lucent 1665 DMX mounting bracket positions - 23-inch frame” (p. 13-9).

For 19-inch frame, front or rear mounting, refer to Figure 13-4, “Alcatel-Lucent 1665 DMX mounting bracket positions - 19-inch frame” (p. 13-10).

Figure 13-3 Alcatel-Lucent 1665 DMX mounting bracket positions - 23-inch frame

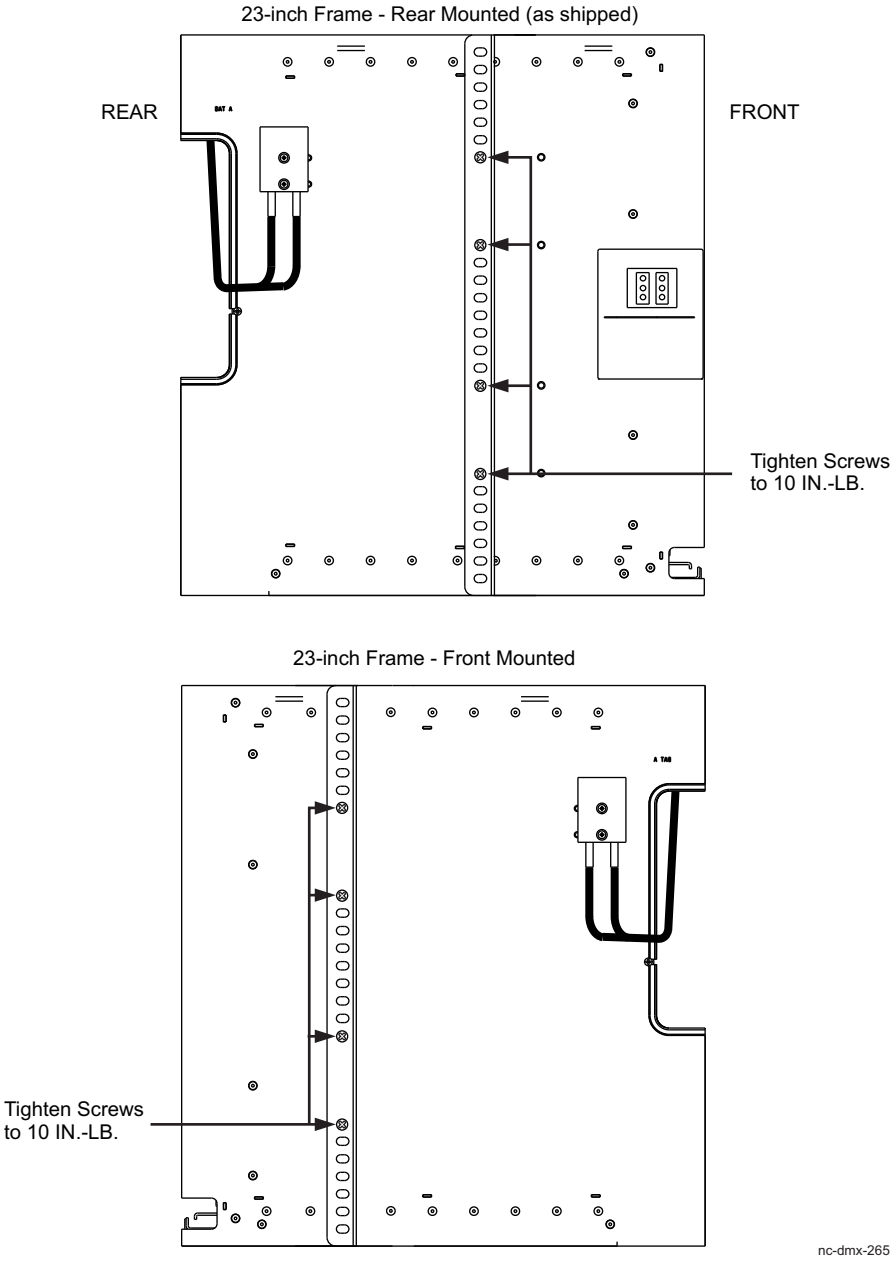
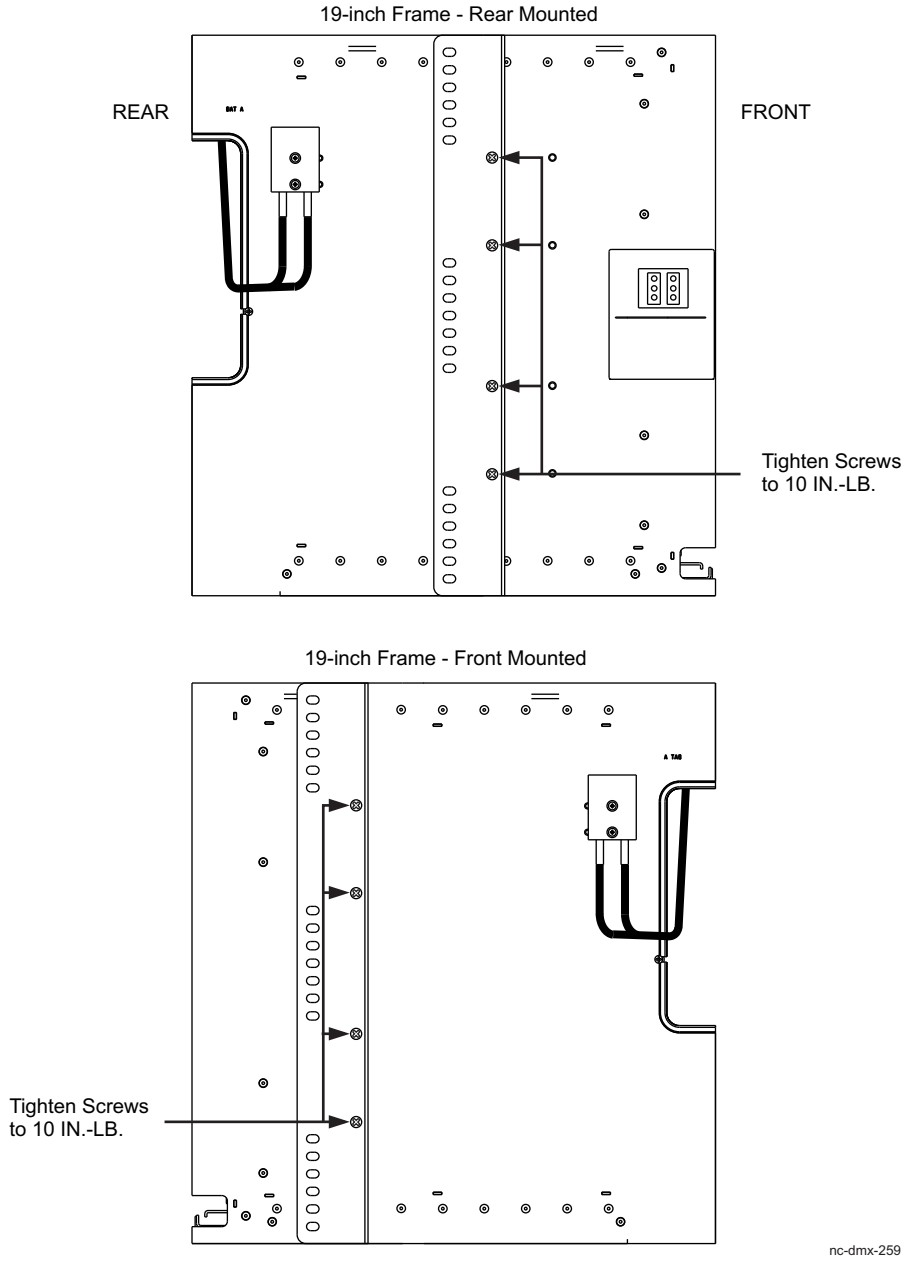


Figure 13-4 Alcatel-Lucent 1665 DMX mounting bracket positions - 19-inch frame

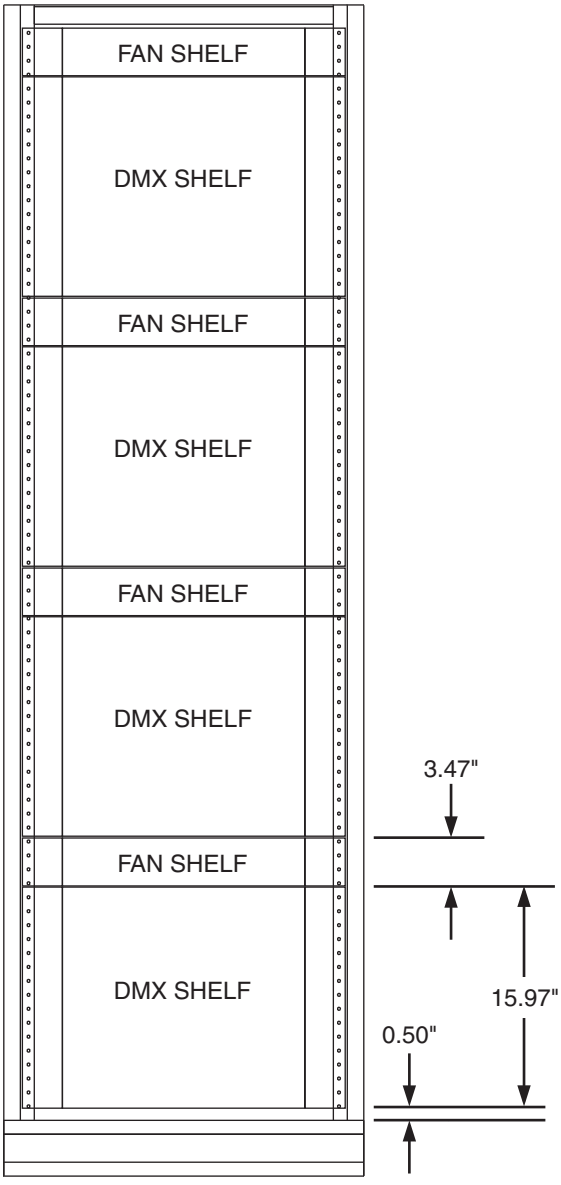


17 Determine the position that the Alcatel-Lucent 1665 DMX shelf will be mounted.

Figure 13-5, “Typical Alcatel-Lucent 1665 DMX standard shelf bay mounting arrangements” (p. 13-11) shows the recommended mounting positions for a standard shelves.

The Alcatel-Lucent 1665 DMX High Capacity shelf has an integrated fan shelf. Figure 13-9, “Typical Alcatel-Lucent 1665 DMX High Capacity shelf bay mounting arrangements” (p. 13-22) shows the recommended mounting positions for a high capacity shelves.

Figure 13-5 Typical Alcatel-Lucent 1665 DMX standard shelf bay mounting arrangements

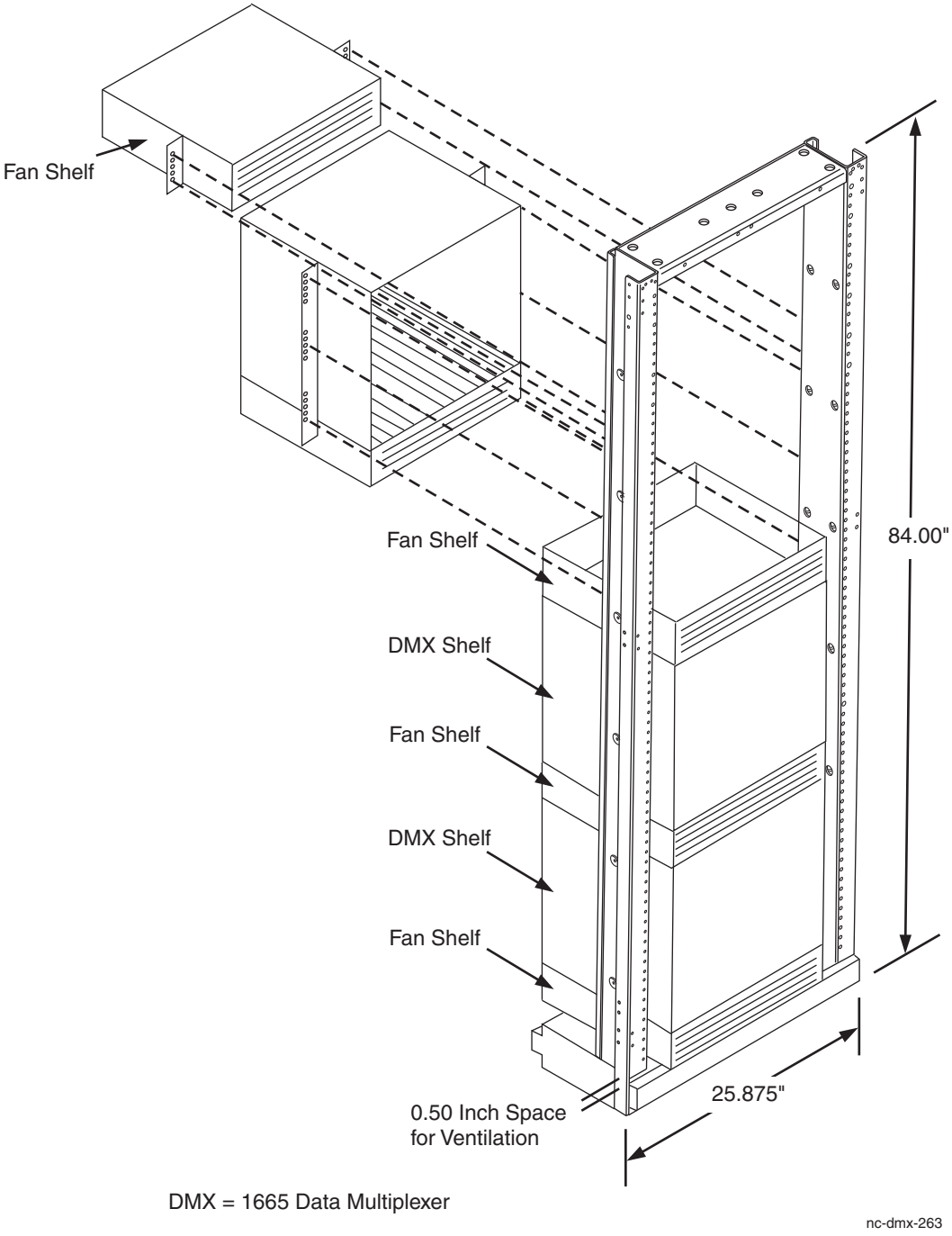


18 Position the Alcatel-Lucent 1665 DMX replacement shelf in the frame and secure the shelf to the frame using the thread-forming screws included with the shelf (3 screws per side). Tighten the screws to 21 in.-lb. (minimum)/30 in.-lb. (maximum)

Figure 13-6, "Alcatel-Lucent 1665 DMX shelf mounted to the rear of a 23-inch frame" (p. 13-13) shows the Alcatel-Lucent 1665 DMX shelf being mounted to the rear of a 23-inch frame in a fully equipped Alcatel-Lucent 1665 DMX bay. The fan shelf may or may not be replaced while replacing the shelf.

Important! Be sure to mount the shelf using the thread-forming screws provided with the shelf to ensure a solid ground connection from the bay to the shelf.

Figure 13-6 Alcatel-Lucent 1665 DMX shelf mounted to the rear of a 23-inch frame



19 Verify with an ohmmeter that the Alcatel-Lucent 1665 DMX shelf is grounded to the bay frame. Measure between the Alcatel-Lucent 1665 DMX shelf mounting bracket and the office ground lug on the bay frame.

Result: The ohmmeter reads less than 1 ohm.

20 Ensure that both 20-ampere circuit breakers on the Alcatel-Lucent 1665 DMX shelf to the OFF position.

Important! A small flat-bladed screwdriver or other similar type tool is required to operate the circuit breakers to the OFF position.

21 Reconnect the A and B power connectors to the left and right sides of the Alcatel-Lucent 1665 DMX shelf.

22 At the rear of the shelf, reconnect all cables based on the labels placed on them when they were removed. If your replacement shelf is a Alcatel-Lucent 1665 DMX High Capacity shelf with high density circuit packs, you must also install additional DS1 cables and/or replace existing DS3 cables with double- density DS3 cabling.

23 Restore power to the Alcatel-Lucent 1665 DMX shelf by operating the circuit breakers to the ON position at the Battery Distribution Feeder Bay (BDFB) or replacing the fuses at the BDFB.

Important! Restore power for both the A and B feeders.

24 Operate both 20-ampere circuit breakers on the Alcatel-Lucent 1665 DMX shelf to the ON position. These breakers are located on the front of the shelf.

Result: The fans start running and both **PWR (A)** and **PWR (B)** LEDs on the front of the shelf light.

25 Fully engage the SYSCTL circuit pack in the shelf.

26 Fully engage the M1 and M2 circuit packs in the shelf.

27 Starting at the left side of the shelf, fully engage each circuit pack in the shelf.

Result: After approximately three minutes, all circuit packs have a lighted, green **ACTIVE** LED.

28



NOTICE

Service-disruption hazard

Signal performance may be degraded if the connectors/adapters, fiber, and LBOs are not cleaned.

Ensure all optical fiber connectors/adapters, fiber, and LBOs are properly cleaned.

Clean and reconnect all optical fibers to the front of the optical circuit packs based on the fiber labels attached earlier and the circuit pack positions noted.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

29 Place loose fibers in the shelf fiber tray.

30 Reconnect the LAN and CIT cables (if equipped) to the front of the SYSCTL circuit pack.

31 Connect the *WaveStar*® CIT and log into the shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

32 From the System View window, click on **Alarm List** button and verify that there are no alarms, lockouts, loopbacks, or switches present.

If required, refer to the appropriate trouble clearing procedures to clear any existing alarms.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 13-3: Replace Alcatel-Lucent 1665 DMX High Capacity shelf

Overview

Use this procedure to replace the Alcatel-Lucent 1665 Data Multiplexer High Capacity shelf (C848793287). The High Capacity shelf has an integrated fan shelf. The standard shelf has a separate fan shelf.

Important! It is assumed that the Alcatel-Lucent 1665 DMX High Capacity shelf is out of service. Power to the shelf will be removed in this procedure.

Required equipment

Important! A Alcatel-Lucent 1665 DMX High Capacity shelf can only be replaced with a Alcatel-Lucent 1665 DMX High Capacity shelf.

The following equipment is required:

- Replacement Alcatel-Lucent 1665 DMX High Capacity shelf. (Refer to Engineering Drawing ED8C871-10 for a complete list of required cables.)
- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap
- Optical fiber connector dust covers
- Optical circuit pack connector dust covers
- ESD protective bags for temporary storage of circuit packs
- *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 13-2) in this chapter
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that the Alcatel-Lucent 1665 DMX High Capacity shelf is out of service.

Steps

Complete the following steps to replace a Alcatel-Lucent 1665 DMX High Capacity shelf.

1 Remove power from the Alcatel-Lucent 1665 DMX High Capacity shelf by operating the circuit breakers to the OFF position at the Battery Distribution Fuse Bay (BDFB) in the central office or removing the fuses at the BDFB.

Important! Remove power for both A and B feeders to the shelf.

Result: Both **PWR (A)** and **PWR (B)** LEDs on the front of the shelf extinguish.

Reference: Refer to the user documentation for your BDFB for more information.

2 Disconnect the A and B power connectors from the left and right sides of the Alcatel-Lucent 1665 DMX High Capacity shelf.

3 Using a voltmeter, measure the voltage on the power cable connectors (looking towards the BDFB) between BAT A and BAT A RTN (red cable).

Result: Voltmeter indicates no voltage.

4 Using a voltmeter, measure the voltage on the power cable connectors (looking towards the shelf's backplane) between BAT B and BAT B RTN (blue cable).

Result: Voltmeter indicates no voltage.

5 On the backplane, label all cables connecting to the Alcatel-Lucent 1665 DMX High Capacity shelf. These include:

- DS1/DS3/EC1/FastE Transmission Cables as equipped (J1, J2, J3, J4, J5, J6, J7, J8, J20, J21, J22, J23, J24, J25, J26, J27)
- IAO LAN (J16)
- Modem cable (J17)
- TL1 Interface Cable (J10)
- Sync Cables (J9 and J14)
- Office Alarm Cable (J12)
- Alarm Mult (J13)
- Miscellaneous (Environmental) Discrete (J11)

6 Remove all cables from the Alcatel-Lucent 1665 DMX High Capacity shelf backplane. It may be necessary to untie the cables from the cable tie bar.

It is not necessary to disconnect the power cables on the backplane connectors (P15 and P14); they are internal to the shelf that is being removed.

7 On the front of the Alcatel-Lucent 1665 DMX High Capacity shelf, label all cables connecting to circuit packs. These include:

- Optical Fibers connected to the Main OLIUs (Transmit/Receive)
- Optical Fibers connected to OC3/OC12/OC48 Low Speed OLIUs in Function Slots A, B, C, D and Growth Slots (Transmit/Receive)
- Optical Fibers connected to Gigabit Ethernet Circuit Packs in Function Slots A, B, C, D and Growth Slots (Transmit/Receive)
- LAN cable
- CIT cable

8 Remove all cables from circuit packs in the Alcatel-Lucent 1665 DMX High Capacity shelf.

9 Place protective dust covers on fiber connections (fibers and circuit packs).

10 Note the position of each circuit pack (Function slot number or Growth slot) for reference when installing the new shelf.

11 Carefully remove the fibers from the Alcatel-Lucent 1665 DMX High Capacity shelf fiber tray.

12 Disengage and remove each circuit pack and place each in an ESD protective bag.

13 Unscrew the mounting screws that attach the Alcatel-Lucent 1665 DMX High Capacity shelf to the bay frame and remove the shelf.

Important! Do not disturb cables associated with other Alcatel-Lucent 1665 DMX High Capacity shelves in the bay or equipment in adjacent bays.

14 Inspect the replacement Alcatel-Lucent 1665 DMX High Capacity shelf for visible damage including bent or touching backplane pins.

15 Determine the mounting configuration for the Alcatel-Lucent 1665 DMX High Capacity shelf:

- type of bay frame (23-inch or 19-inch wide)
- mounting position (front or rear)
- position in bay (bottom to top).

Important! The Alcatel-Lucent 1665 DMX High Capacity shelf is shipped with the mounting brackets positioned for mounting to the rear of a 23-inch wide network bay frame. The Alcatel-Lucent 1665 DMX High Capacity shelf mounting brackets may have to be repositioned and remounted, depending on the frame type and mounting position (front or rear).

16 If necessary, reposition the shelf mounting brackets accordingly.

For 23-inch frame, front or rear mounting, refer to Figure 13-7, “Alcatel-Lucent 1665 DMX High Capacity mounting bracket positions - 23-inch frame” (p. 13-20).

For 19-inch frame, front or rear mounting, refer to Figure 13-8, “Alcatel-Lucent 1665 DMX High Capacity mounting bracket positions - 19-inch frame” (p. 13-21).

Figure 13-7 Alcatel-Lucent 1665 DMX High Capacity mounting bracket positions - 23-inch frame

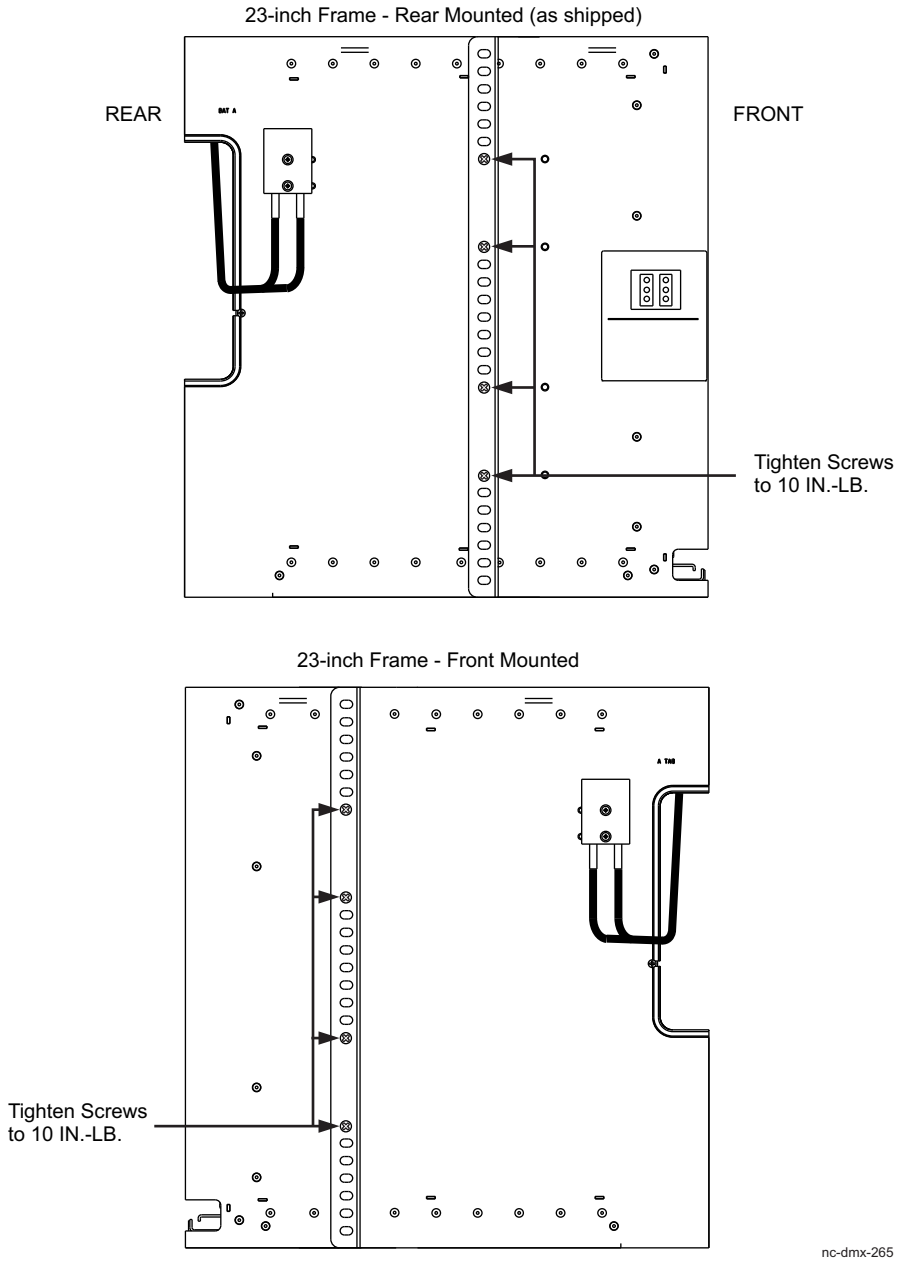
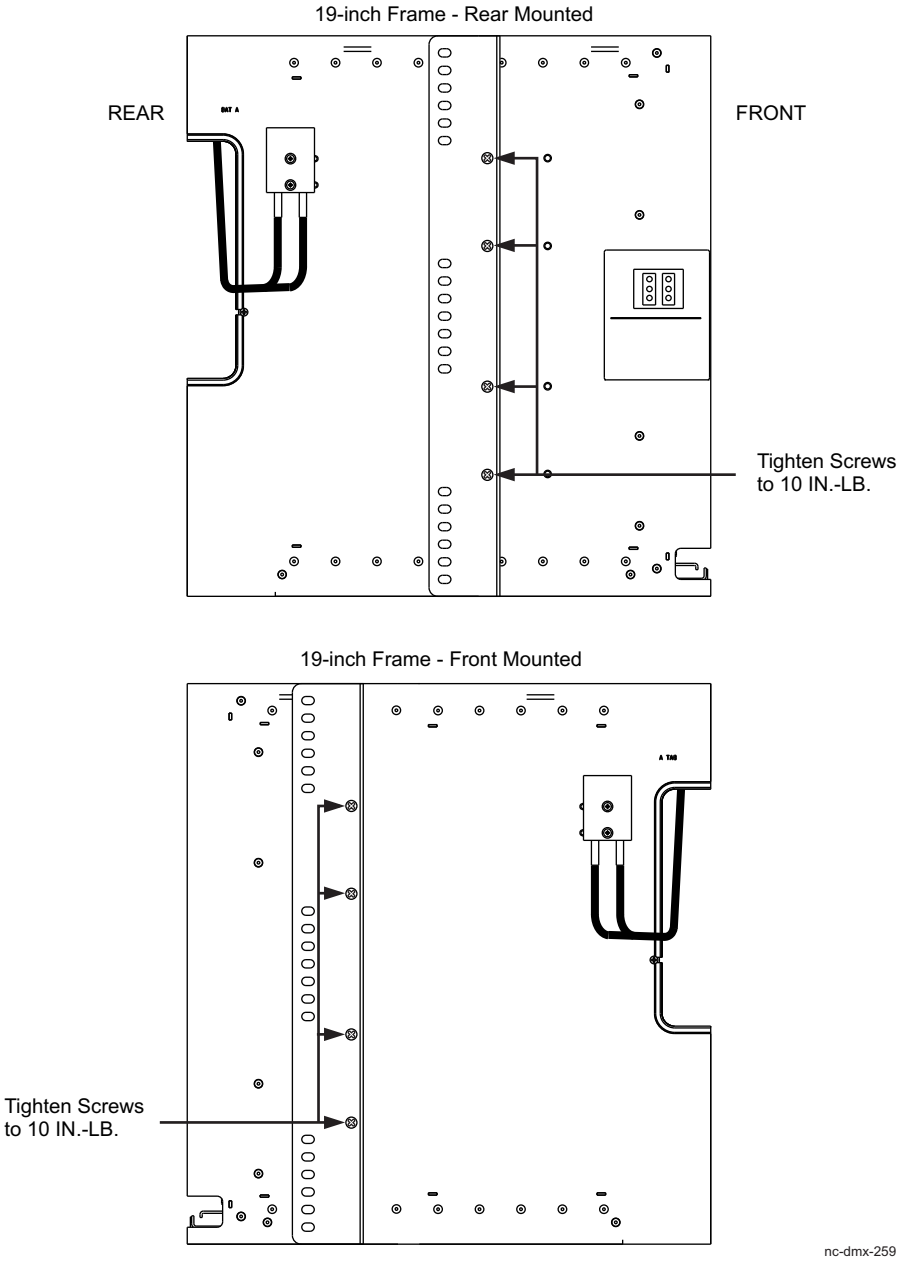


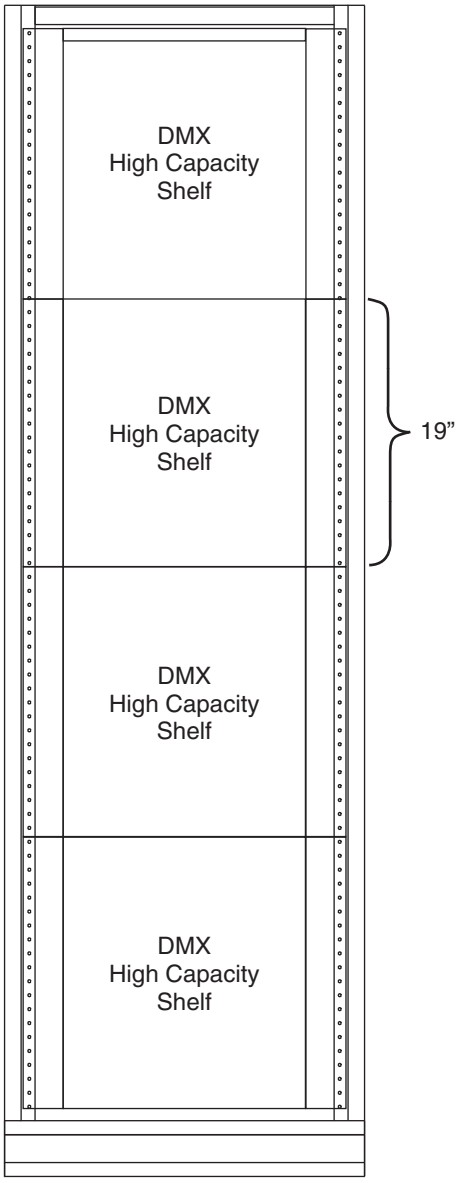
Figure 13-8 Alcatel-Lucent 1665 DMX High Capacity mounting bracket positions - 19-inch frame



17 Determine the position that the Alcatel-Lucent 1665 DMX High Capacity shelf will be mounted.

Figure 13-9, “Typical Alcatel-Lucent 1665 DMX High Capacity shelf bay mounting arrangements” (p. 13-22) shows the recommended mounting positions.

Figure 13-9 Typical Alcatel-Lucent 1665 DMX High Capacity shelf bay mounting arrangements

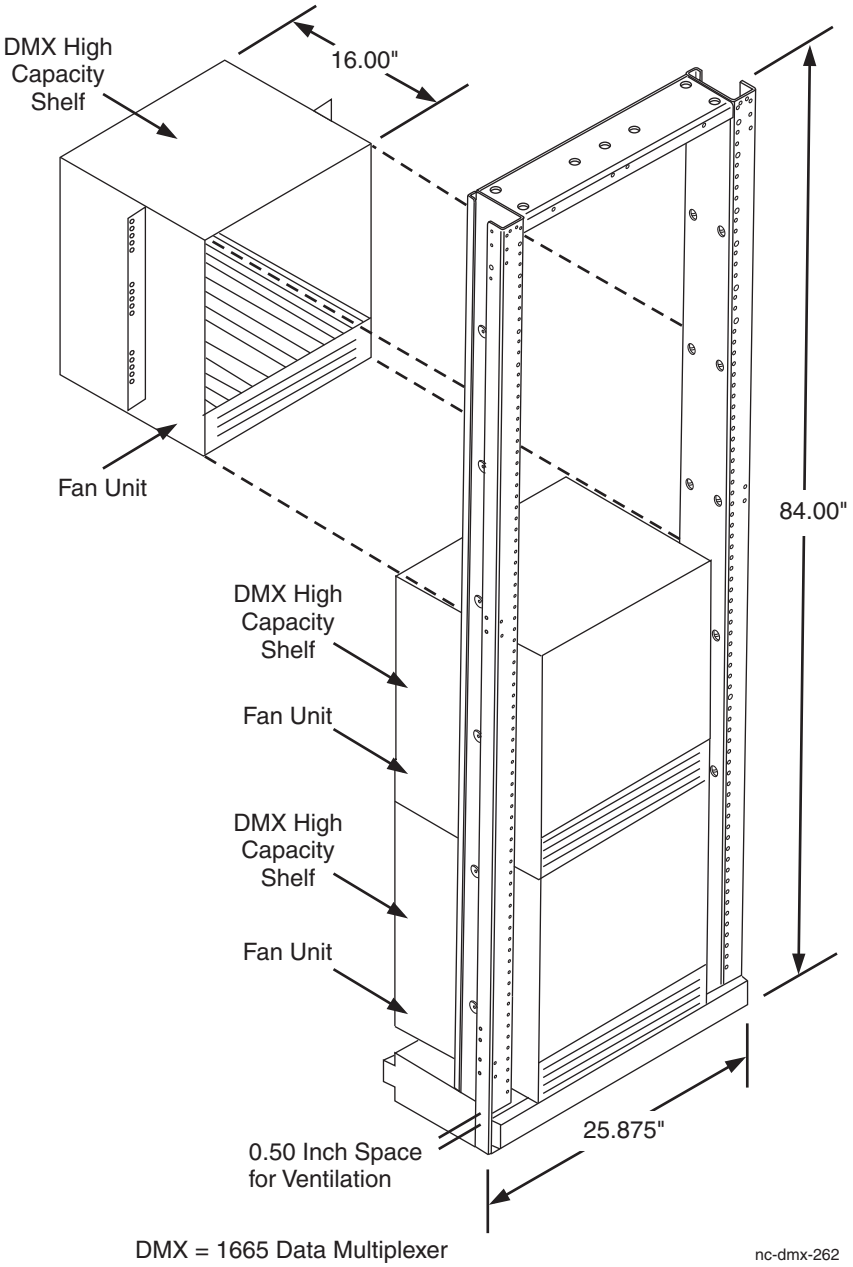


18 Position the Alcatel-Lucent 1665 DMX High Capacity shelf in the frame and secure the shelf to the frame using the thread-forming screws included with the shelf (3 screws per side). Tighten the screws to 21 in.-lb. (minimum)/30 in.-lb. (maximum)

Figure 13-10, "Alcatel-Lucent 1665 DMX High Capacity shelf mounted to the rear of a 23-inch frame" (p. 13-23) shows the Alcatel-Lucent 1665 DMX High Capacity shelf being mounted to the rear of a 23-inch frame in a fully equipped Alcatel-Lucent 1665 DMX bay.

Important! Be sure to mount the shelf using the thread-forming screws provided with the shelf to ensure a solid ground connection from the bay to the shelf.

Figure 13-10 Alcatel-Lucent 1665 DMX High Capacity shelf mounted to the rear of a 23-inch frame



19 Verify with an ohmmeter that the Alcatel-Lucent 1665 DMX High Capacity shelf is grounded to the bay frame. Measure between the Alcatel-Lucent 1665 DMX High Capacity shelf mounting bracket and the office ground lug on the bay frame.

Result: The ohmmeter reads less than 1 ohm.

20 Ensure that both circuit breakers on the Alcatel-Lucent 1665 DMX High Capacity shelf to the OFF position.

Important! A pen or similar object is required to operate the circuit breakers to the OFF position.

21 Reconnect the A and B power connectors to the left and right sides of the Alcatel-Lucent 1665 DMX High Capacity shelf.

22 At the rear of the shelf, reconnect all cables based on the labels placed on them when they were removed.

23 Restore power to the Alcatel-Lucent 1665 DMX High Capacity shelf by operating the circuit breakers to the ON position at the Battery Distribution Feeder Bay (BDFB) or replacing the fuses at the BDFB.

Important! Restore power for both the A and B feeder.

24 Operate both circuit breakers on the Alcatel-Lucent 1665 DMX High Capacity shelf to the ON position. These breakers are located on the front of the shelf.

Result: The fans start running and both **PWR (A)** and **PWR (B)** LEDs on the front of the shelf light.

25 Fully engage the SYSCTL circuit pack in the shelf.

26 Fully engage the M1 and M2 circuit packs in the shelf.

27 Starting at the left side of the shelf, fully engage each circuit pack in the shelf.

Result: After approximately three minutes, all circuit packs have a lighted, green **ACTIVE** LED.

28



NOTICE

Service-disruption hazard

Signal performance may be degraded if the connectors/adapters, fiber, and LBOs are not cleaned.

Ensure all optical fiber connectors/adapters, fiber, and LBOs are properly cleaned.

Clean and reconnect all optical fibers to the front of the optical circuit packs based on the fiber labels attached earlier and the circuit pack positions noted.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

29 Place loose fibers in the shelf fiber tray.

30 Reconnect the LAN and CIT cables (if equipped) to the front of the SYSCTL circuit pack.

31 Connect the *WaveStar*® CIT and log into the shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

32 From the System View window, click on **Alarm List** button and verify that there are no alarms, lockouts, loopbacks, or switches present.

If required, refer to the appropriate trouble clearing procedures to clear any existing alarms.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 13-4: Enter/exit pluggable transmission module maintenance state

Overview

Use this procedure to enter or exit the pluggable transmission module maintenance state.

Pluggable transmission module maintenance state

A pluggable transmission module enters the maintenance state when the pluggable transmission module Maintenance State parameter is provisioned to *Maint*.

When the Maintenance State parameter is provisioned to *Maint*, the system reports `Pluggable transmission module maintenance IP` and `ABN condition`. Any subsequent removal of the pluggable transmission module is reported with an alarm severity level no higher than a standing condition regardless of the assigned ASAP alarm severity level.

A pluggable transmission module remains in the maintenance state until the pluggable transmission module Maintenance State parameter is provisioned to *Normal* (default value). Any subsequent removal of the pluggable transmission module is reported using the applicable assigned ASAP alarm severity level.

Entering/exiting the Maintenance state does not affect the alarm severity level of any existing removal alarms.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 13-2) in this chapter.
2. Obtain the work instructions for this procedure.
3. Verify that the work instructions specify the required pluggable transmission module addresses.

Steps

Complete the following steps to enter or exit the pluggable transmission module maintenance state.

1 From the System View window, select **Configuration** → **Equipment**.

Result: The *Configure Equipment* window opens.

2 Find the circuit pack with the required pluggable transmission module, then expand the equipment list by clicking on the plus (+) sign next to the required circuit pack. Select the required *PTM* and click **Select**.

Result: The pluggable transmission module parameters appear.

3 **Important!** When the Maintenance State parameter is provisioned to *Maint*, the pluggable transmission module enters the maintenance state. When the Maintenance State parameter is provisioned to *Normal*, the pluggable transmission module exits the maintenance state.

Provision the *Maintenance State* parameter according to the work instructions, then click **Apply**. Click **Close** to exit.

END OF STEPS

14 Supporting procedures

Overview

Purpose

The following procedures are detailed step-by-step instructions that support other procedures. Procedures for installing the *WaveStar*® CIT software onto a PC, connecting the *WaveStar*® CIT to the NE, and establishing a *WaveStar*® CIT session with the NE are also included.

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Before you begin

Before you begin

Prior to performing *most* procedures in this chapter,

1. If not previously completed, install generic and *WaveStar*® CIT software on the PC. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Connect PC and establish a *WaveStar*® CIT session.

   Refer to Procedure 14-2: “Connect Personal Computer (PC) and establish *WaveStar*® CIT session” (p. 14-27).

Required equipment

Most procedures in this chapter require the following equipment:

- Personal Computer (PC) with *WaveStar*® CIT software installed
- Wrist strap

  Important! Also refer to the procedure to be performed for other equipment requirements. If other equipment is required to perform a specific procedure, that equipment is listed in the procedure.

Procedure 14-1: Install software on the PC

Overview

Use this procedure to install the *WaveStar*® CIT software and/or the NE software generic on a personal computer (PC).

Required equipment

The following equipment is required:

- Personal Computer (PC) with at least one network interface card (NIC).
- Copy of the CD-ROM that includes the *WaveStar*® CIT software and NE software.
- Current *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed.

Before you begin

Before beginning the software installation procedure, complete the following steps:

1. Become familiar with the characteristics and operating procedures of your PC and the operating system installed.
2. Ensure the user is in the administrative or power user group of the PC to install, update, modify, or repair the *WaveStar*® CIT.
3. If your PC is equipped with multiple network interface cards (NICs), know the IP address of the NIC you will be using as the *WaveStar*® CIT interface. If you are using DHCP with multiple NICs, you may need to temporarily remove all NICs except the one you plan to use for this interface.
4. Operate laptop PCs on AC power during download procedures.
5. Ensure that a laptop PC is not docked in a docking station or port replicator. Because OSI may bind to docking station NIC, you cannot install the *WaveStar*® CIT on a PC while it is in a docking station.
6. Follow proper procedures in handling the CD-ROM.
7. Read the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Software Release Description* for the software generic being installed.
8. Ensure that the list of supported network elements in the readme.txt file includes all the NEs and releases that you wish to manage with this release of the *WaveStar*® CIT.

   To access the readme.txt file, refer to the graphic in Step 2, click **Documents**, and then click **List Contents**.

Procedure

Complete the following steps to install the *WaveStar*® CIT software and/or network element software generic and on your PC.

1 With the PC *not* connected to the Alcatel-Lucent 1665 DMX shelf, insert the CD-ROM into the PC.

Result:

The CD autoruns and the following window opens:



Rxx.xx.xx in the figure represents the *WaveStar*® CIT release number, for example R24.00.00.

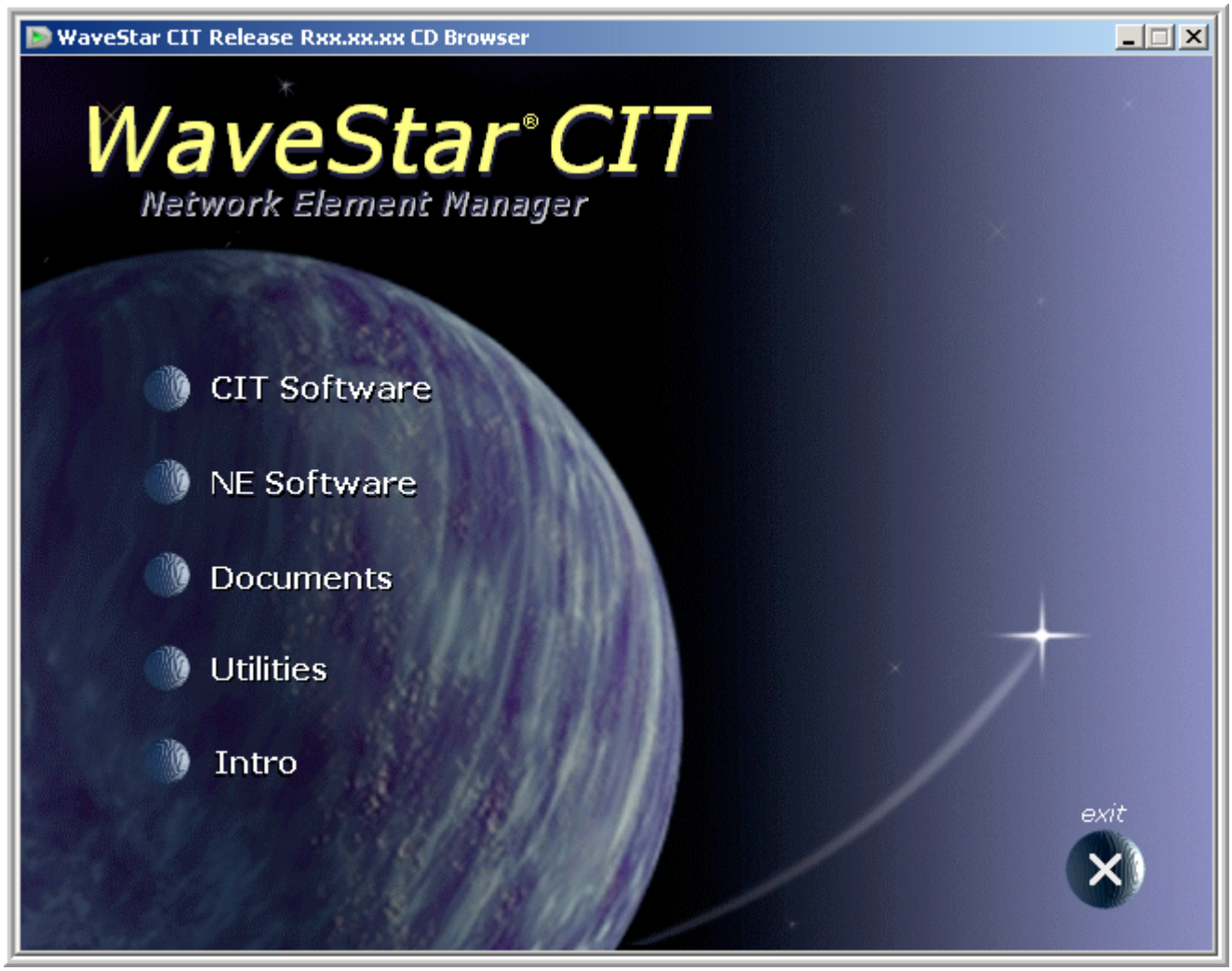
If the CD-ROM does not autorun, verify that the CD is inserted properly in your CD-ROM drive.

1. Double-click on My Computer on your desktop.
2. Double-click on your Compact Disc icon (often identified as drive D:).
3. Double-click on setup.exe

2 Click **continue**.

Result:

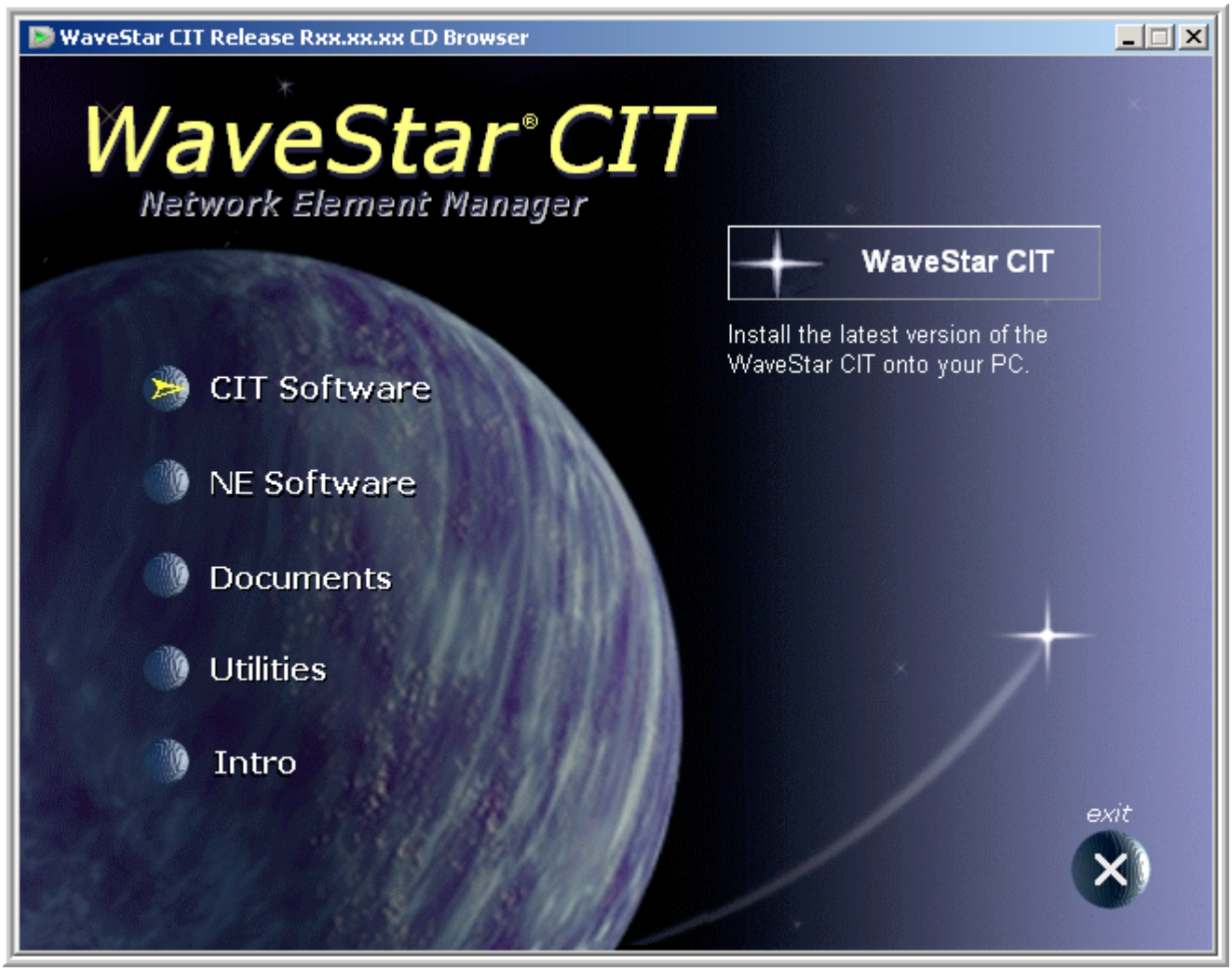
The following window opens:



3 Click **CIT Software**.

Result:

The following window appears.



4 Which software package so you wish to install on your computer?

If...	Then...
WaveStar® CIT software	Proceed to Procedure 14-1.1: " Install *WaveStar*® CIT software on your PC" (p. 14-9).
NE Software	Proceed to Procedure 2-8: "Apply software generic" (p. 2-141).

END OF STEPS

Procedure 14-1.1: Install *WaveStar*® CIT software on your PC

Overview

Use this procedure to install the *WaveStar*® CIT software on a personal computer (PC).

Before you begin

Before performing this procedure, complete Procedure 14-1: "Install software on the PC" (p. 14-4).

Steps

Complete the following steps to install the *WaveStar*® CIT software on your PC.

1 Click **WaveStar CIT** to install the *WaveStar*® CIT software.

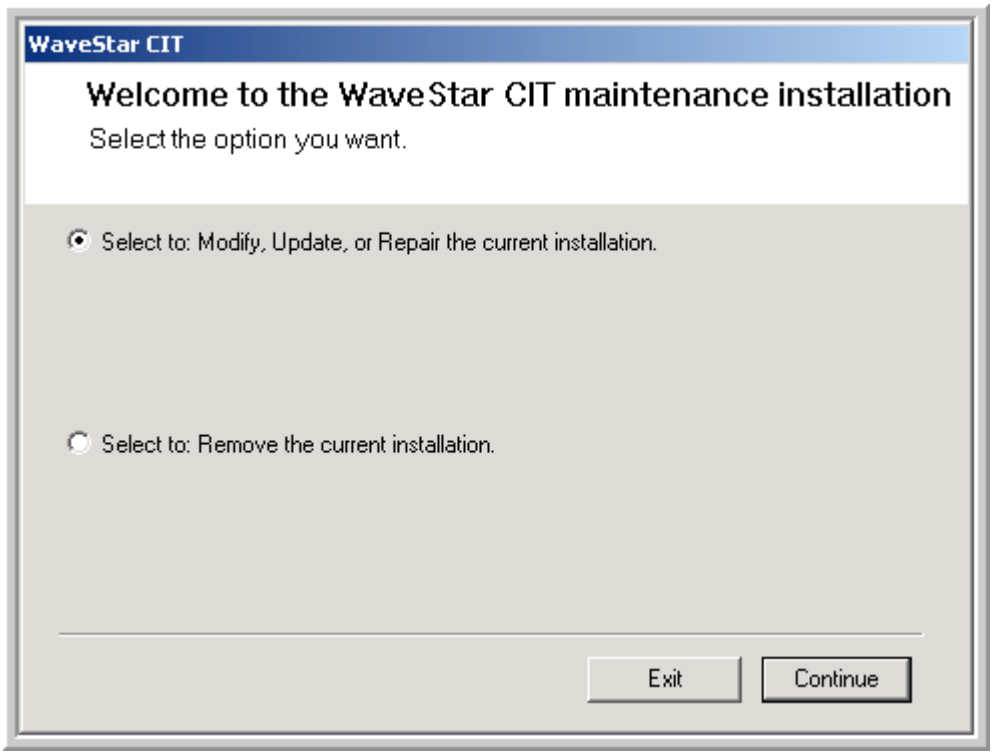
Result: Either the *WaveStar CIT InstallShield* or the *WaveStar CIT maintenance installation* screen appears.

2 A screen may appear stating that the *WaveStar*® CIT requires items (Java and/or Microsoft C++) to be installed on your computer before the installation can continue. Follow the instructions to install these items.

3 Do you have a previous version of the *WaveStar*® CIT installed on your computer?

If...	Then...
Yes	Continue with Step 4.
No	Proceed to Step 8.

4 When the following window opens, select **Select to: Modify, Update, or Repair the current installation**. Click **Continue**.



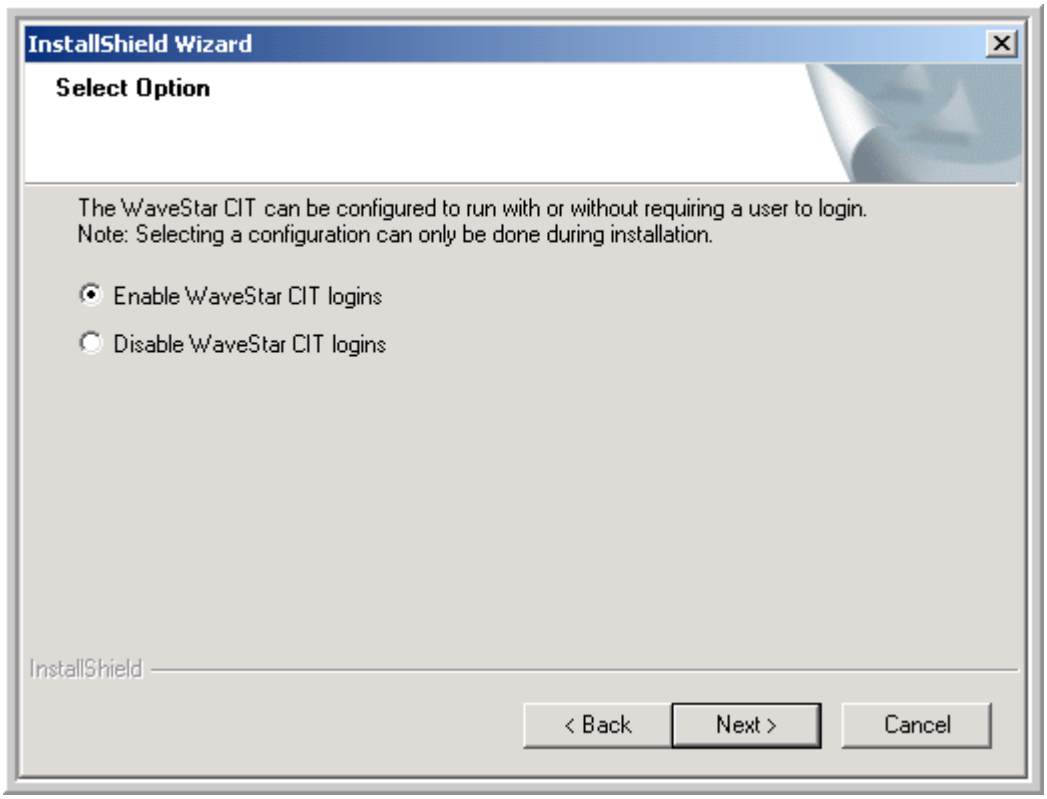
5 Select either

- **Enable WaveStar CIT logins** to require that users enter a user ID and password to login to the *WaveStar*® CIT

  or

- **Disable WaveStar CIT logins** to allow users to run the *WaveStar*® CIT without entering a user ID and password.

Click **Next**.



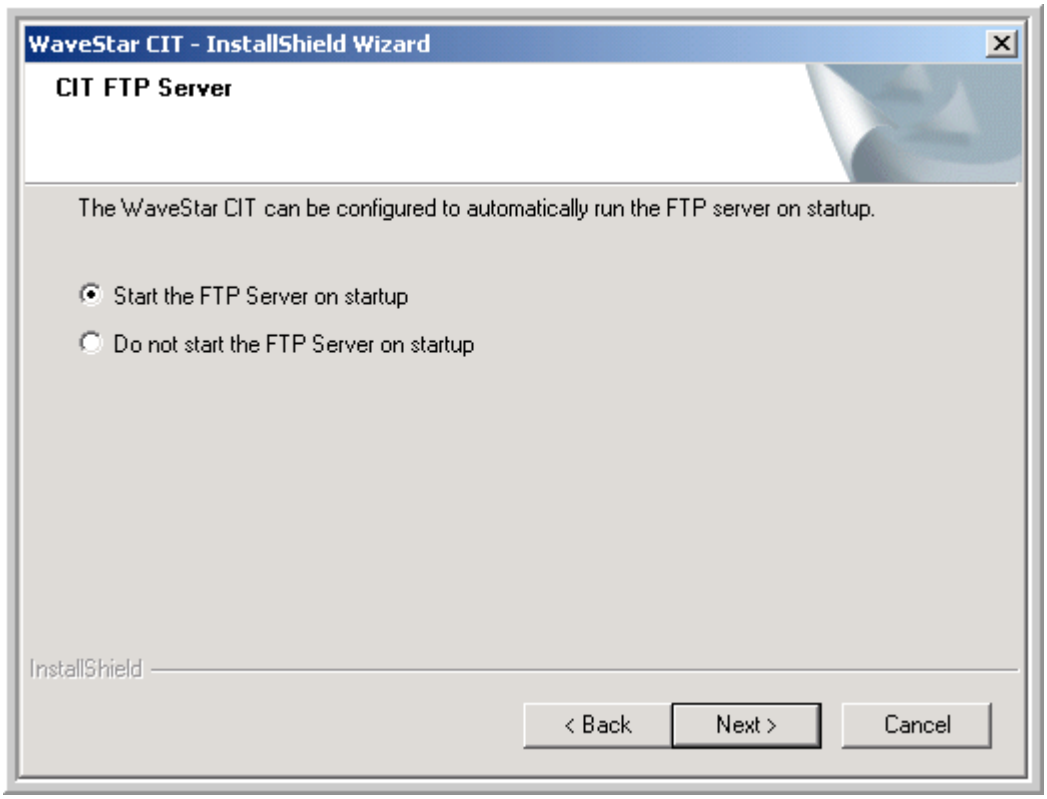
6 Select either

- **Start the FTP Server on startup**

  or

- **Do not start the FTP Server on startup**

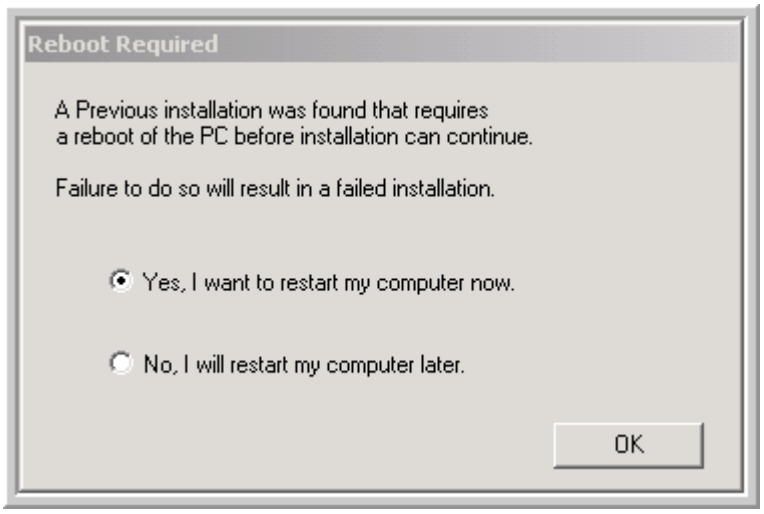
Click **Next**.



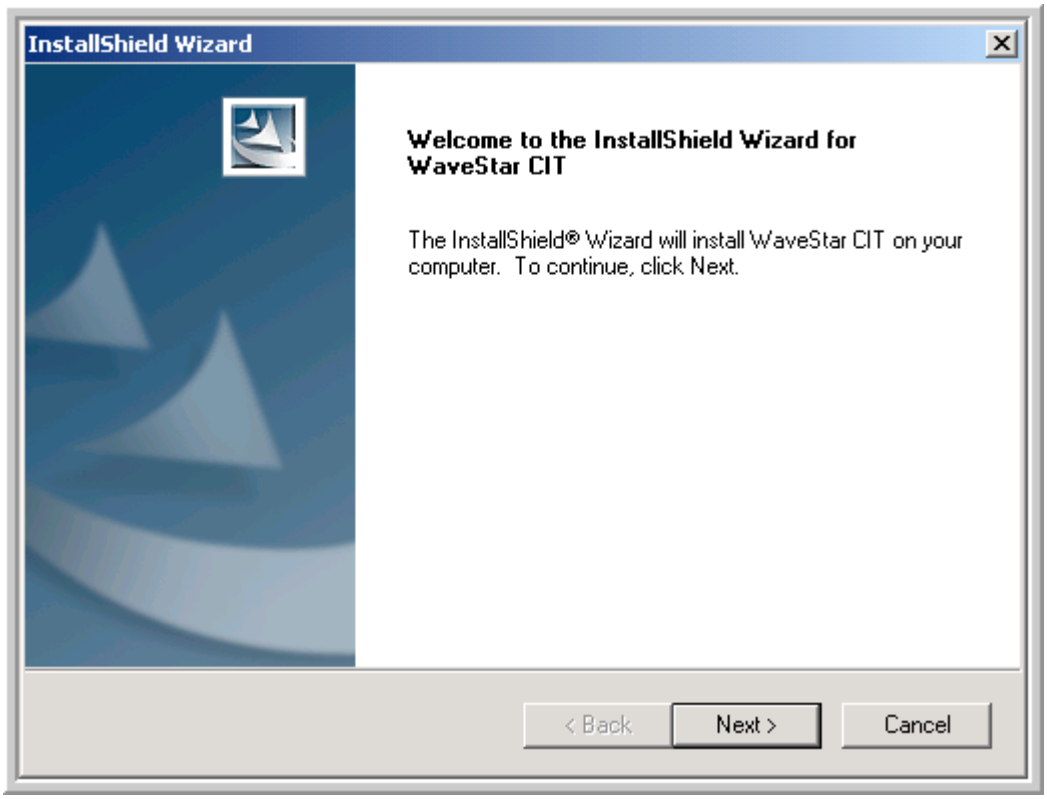
If the *WaveStar*® CIT FTP Server is not configured to automatically start on startup during installation, the FTP Server must be started manually from the Network View menu, **Administration** → **FTP Administration**.

7 Do you see the *Reboot Required* screen illustrated in this step?

If...	Then...
Yes	The *WaveStar*® CIT installer has detected an older version of the *WaveStar*® CIT on your PC which must be removed prior to the new *WaveStar*® CIT installation. Select "**Yes, I want to restart my computer now**." Click **OK**. After your computer reboots, restart the installation from Step 1.
No	Proceed to Step 13.



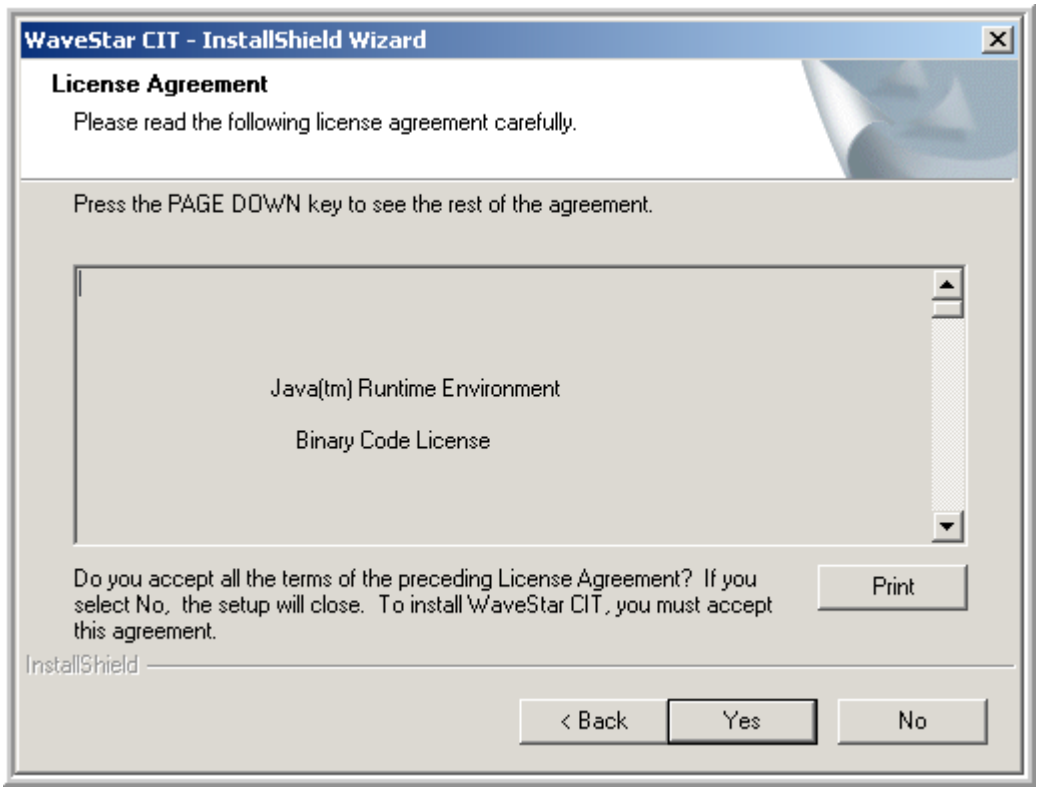
8 When the *InstallShield*® Wizard appears, click **Next**.



9 Follow the instructions on the different *InstallShield*® Wizard windows, including reading and agreeing to the following two License Agreements.



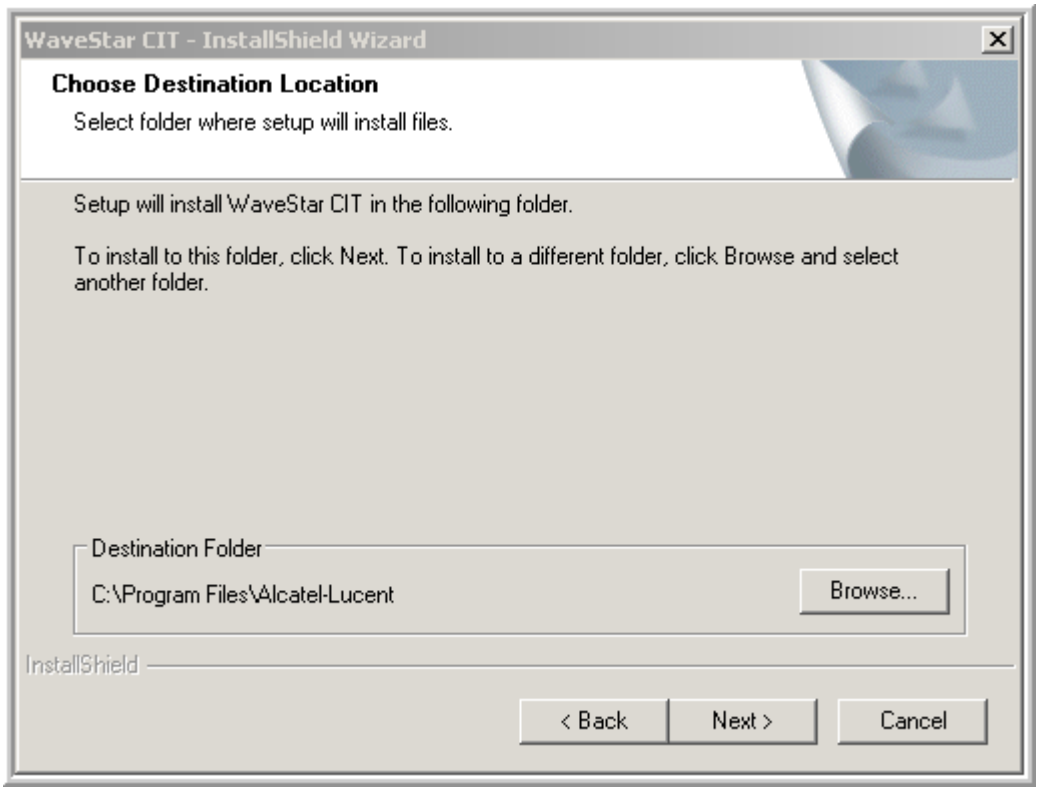
Click **Yes**.



Click **Yes**.

10 Select where you want the *WaveStar*® CIT software installed on your PC.

- Click **Next** to select the default Destination Folder: C:\Program Files\Alcatel-Lucent\. If you had an older *WaveStar*® CIT installed prior to installing the current *WaveStar*® CIT, your path could start with C:\Program Files\Lucent Technologies\.
  OR
- Click **Browse** and navigate to your desired directory and then click **Next**.



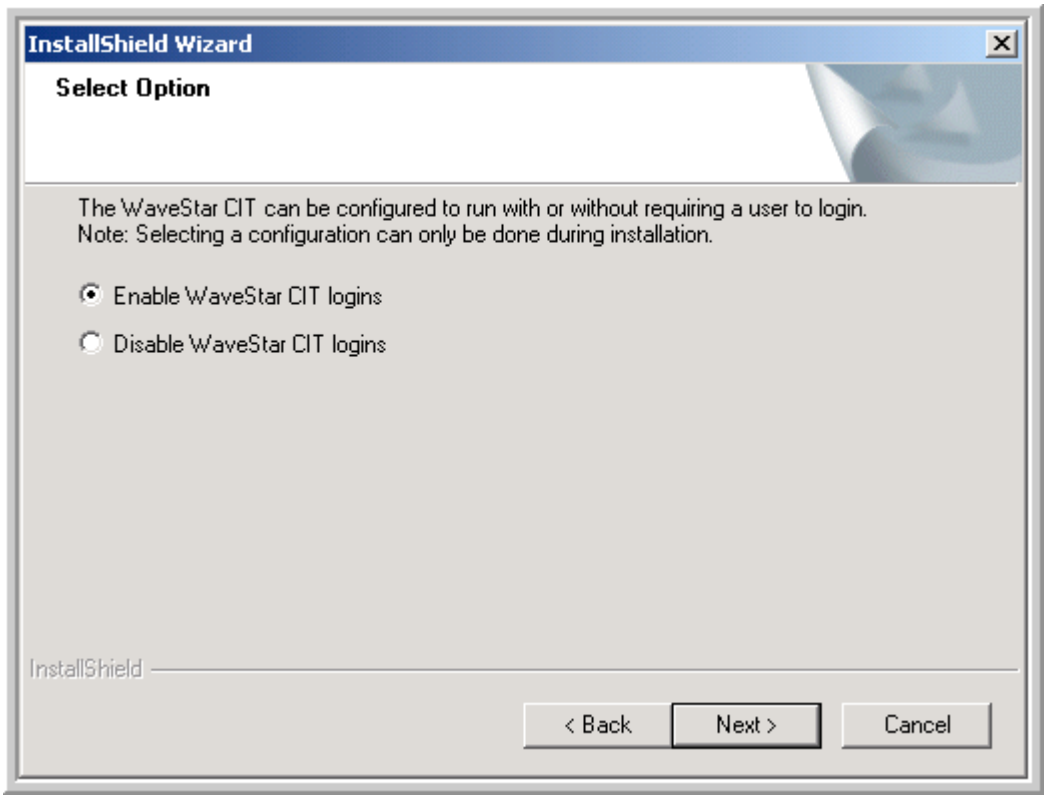
11 Select either

- **Enable WaveStar CIT logins** to require that users enter a user ID and password to login to the *WaveStar*® CIT

  or

- **Disable WaveStar CIT logins** to allow users to run the *WaveStar*® CIT without entering a user ID or password.

Click **Next**.



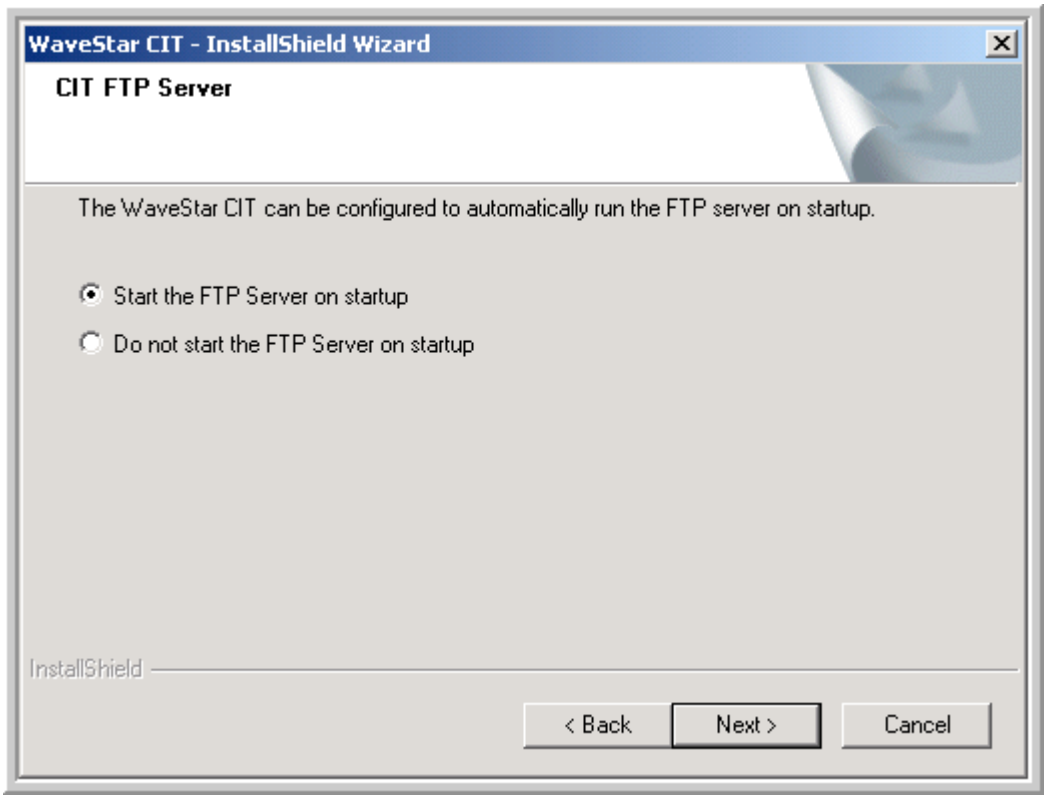
12 Select either

- **Start the FTP Server on startup**

  or

- **Do not start the FTP Server on startup**

Click **Next**.



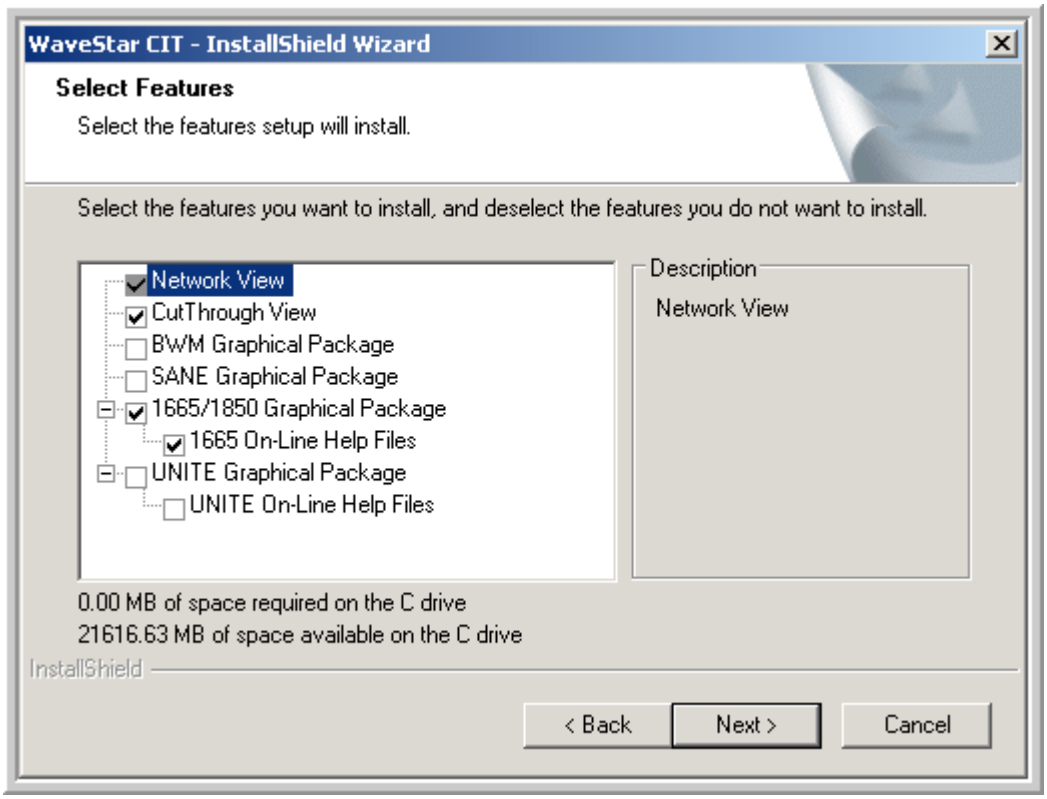
If the *WaveStar*® CIT FTP Server is not configured to automatically start on startup during installation, the FTP Server must be started manually from the Network View menu, **Administration** → **FTP Administration**.

13 Select the following components to complete the *WaveStar*® CIT installation.

- **Network View**
- **CutThrough View**
- **1665/1850 Graphical Package** installs the *WaveStar*® CIT packages for Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1665 DMXplore, Alcatel-Lucent 1850 TSS-5
  - **1665 On-Line Help Files**

    If you do not wish to install online help for any of the Alcatel-Lucent 1665 products (Alcatel-Lucent 1665 DMX, Alcatel-Lucent 1665 DMXtend, Alcatel-Lucent 1665 DMXplore), you may uncheck the **1665 On-Line Help Files** box.

    Alcatel-Lucent 1850 TSS-5 does not include online help.



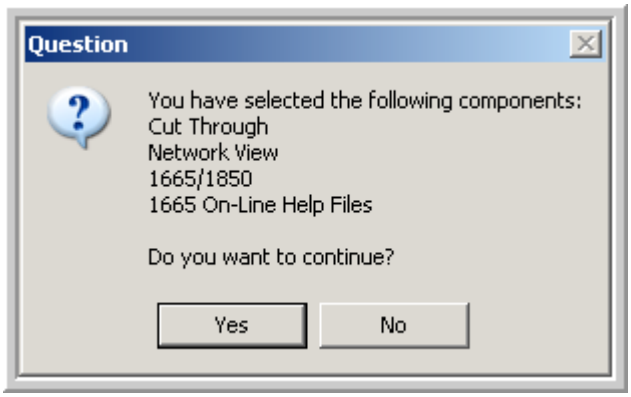
Important! The initial component selections that appear are based on the previous installation.

To save valuable disk space and reduce installation time, you can deselect graphical packages for all products that you do not plan to manage with this *WaveStar*® CIT.

Space Required on "C": indicates the space required to install you selected components. (If you specified an installation location other than Drive C, "C" may be a different drive.) If you had a previous version of the *WaveStar*® CIT installed on your computer and you are not changing your selected components, the *Space Required on "C":* is zero. In this situation, the components are already resident on the computer, therefore no additional space required when performing an upgrade. If any additional (new) packages are selected, the space required for those specific packages is displayed.

14 Click **Next**.

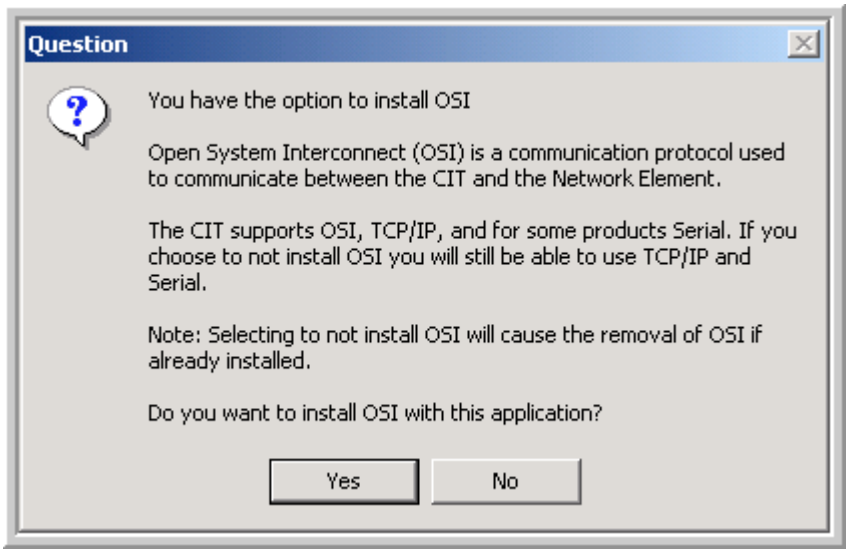
Result: The following screen appears. Confirm your component selection Your list of selected components may be different than this screen.



15 Click **Yes**.

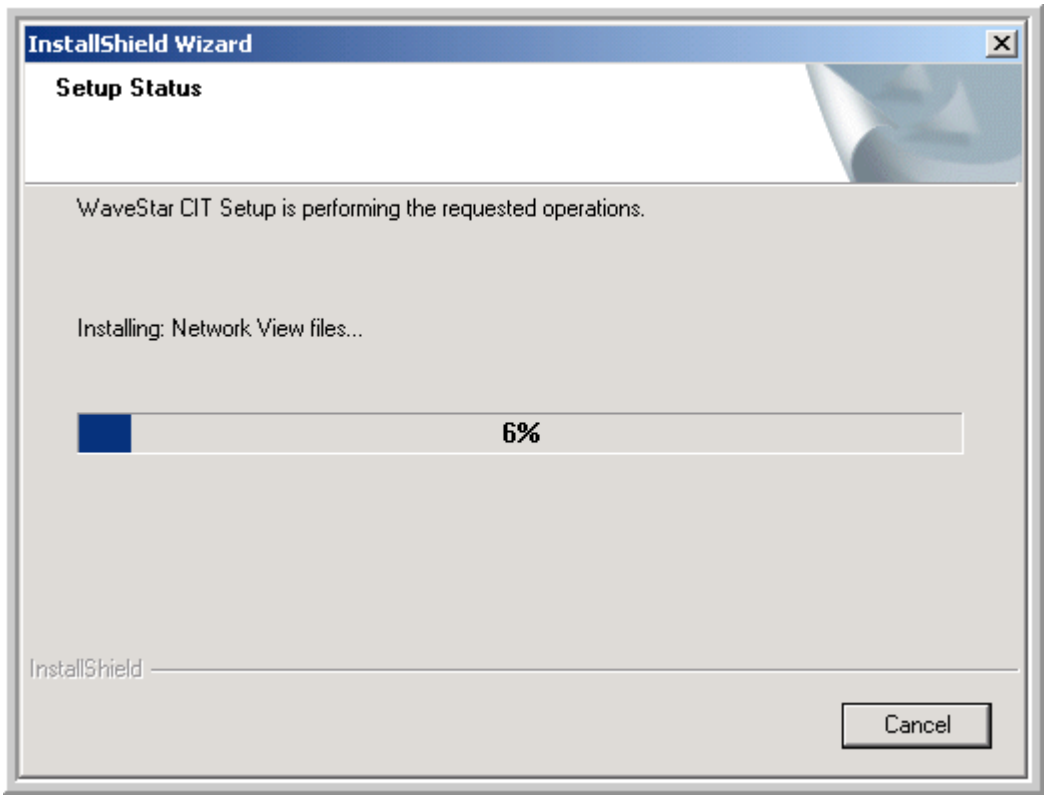
Result:

You are prompted with the choice to install OSI (Open System Interconnect) communications protocol.

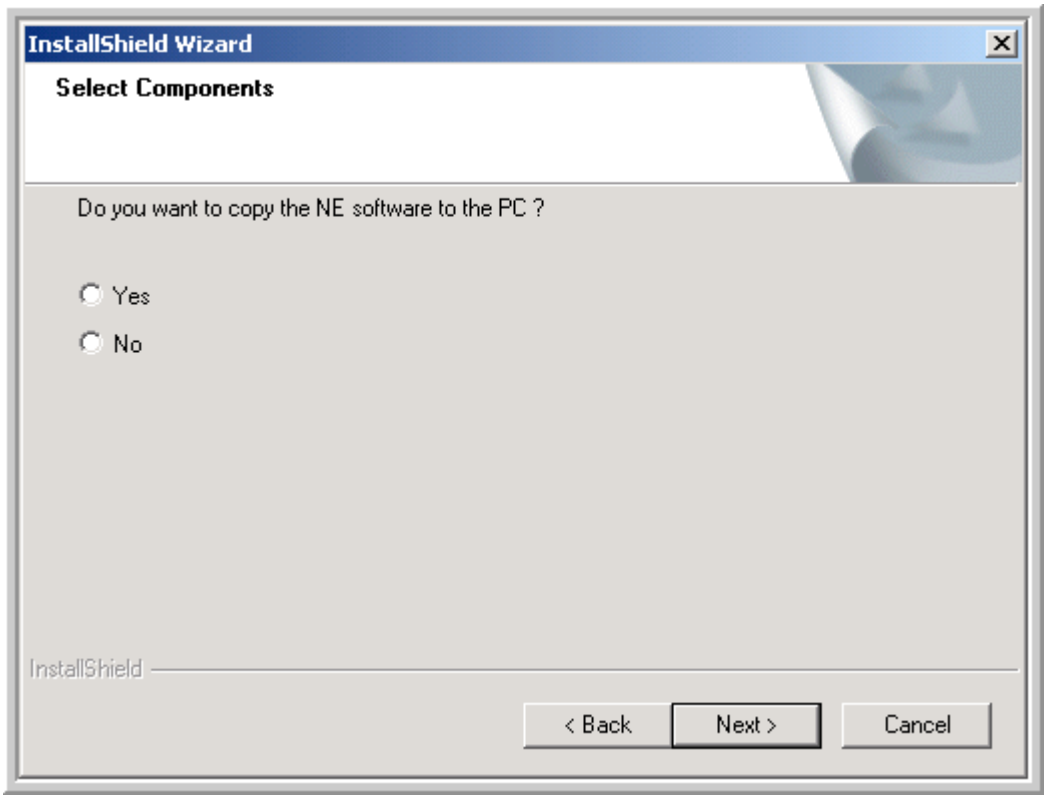


16 If you wish to install OSI click **Yes**, otherwise, click **No**.

Result: The following progress indicator screen appears while the *InstallShield*® Wizard installs the required files.



17 If you wish to copy the NE software to your PC, select **Yes** on the following screen.



18 Did you select Yes or No in Step 17?

If...	Then...
Yes	Continue with Step 19.
No	If you wish to install the NE software later, refer to Procedure 14-1.2: "Install Alcatel-Lucent 1665 DMX software on your PC" (p. 14-26). Proceed to Step 20.

19 A *Copying files, please wait* window appears. When the window closes, the software files are successfully copied into the generics directory on your PC. By default, this directory is **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**, however, the actual directory is determined by the path defined in Step 10.

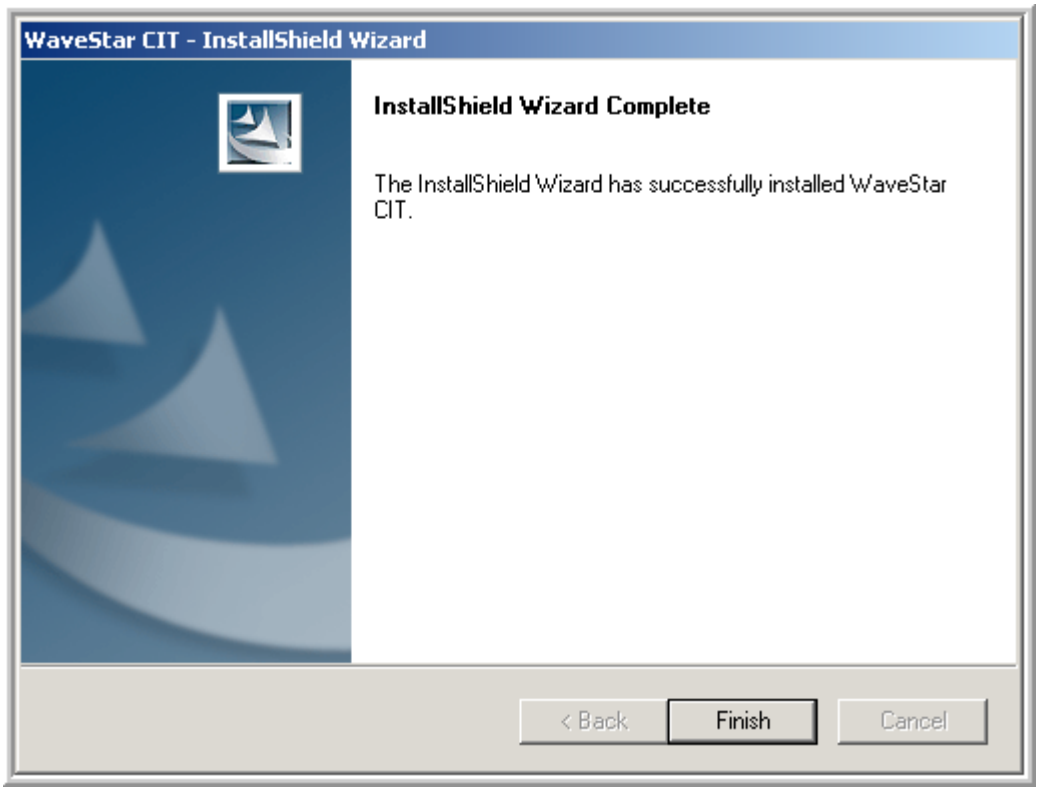
Result: After the NE software is successfully copied to the appropriate directory. If you answered yes in Step 3, you may still have the following folder on your Desktop. If you answered no in Step 3, you do not see this folder.



20 In Step 16, did you elect to install OSI?

If…	Then…
No	Continue with Step 21.
Yes	Proceed to Step 24.

21 When the following screen appears, the installation without OSI is complete.



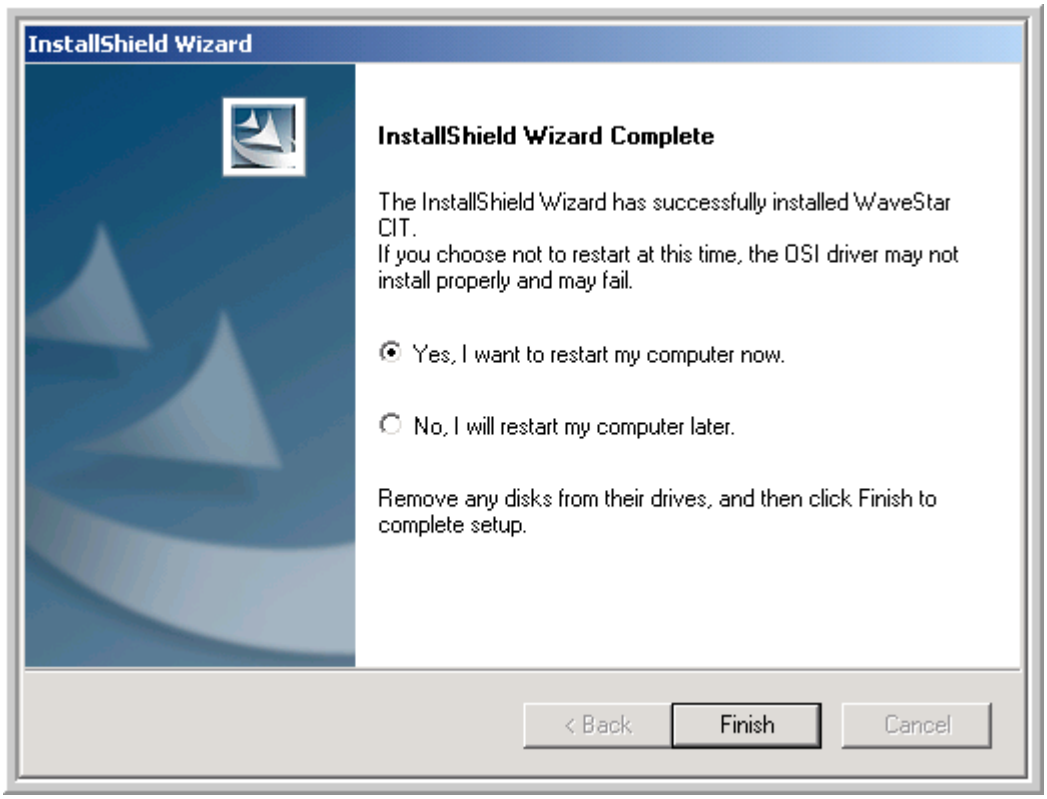
22 Click **Finish**.

Result: The following icon appears on your desktop. Click this short-cut icon to launch the *WaveStar*® CIT.



23 Proceed to Step 26.

24 When the following screen appears, the installation with OSI is complete.



25 **Important!** Before using your new *WaveStar*® CIT, you *MUST* reboot your computer.

Select **Yes, I want to restart my computer now.** and click **Finish**.

Result: The following icon appears on your desktop. After you restart your PC, click this short-cut icon to launch the *WaveStar*® CIT.



26 **Important!** The *InstallShield*® Wizard may create temporary folders/files in the PC system *Temp* folder. Temporary folders/files stored in the PC system *Temp* folder decrease available disk free space and may affect system performance.

If desired, close all open applications running on the PC and delete the appropriate temporary folders/files from the system *Temp* folder.

The *Temp* folder is defined by the TEMP system variable. It can be on any hard drive, but is usually defined as *c:\Temp*.

Windows operating systems provide a Disk Cleanup Wizard that can be used to remove temporary folders/files. To use the Disk Cleanup Wizard select **Start** → **Programs** → **Accessories** → **System Tools** → **Disk Cleanup**.

END OF STEPS

Procedure 14-1.2: Install Alcatel-Lucent 1665 DMX software on your PC

Overview

Use this procedure to install the Alcatel-Lucent 1665 DMX software on your personal computer (PC).

Before you begin

Before performing this procedure, complete Procedure 14-1: “Install software on the PC” (p. 14-4).

Steps

1 In the *WaveStar CIT CD Browser* window, click on **NE Software**, click **NE Software (Copy the NE Software to the PC)** on the right.

Result: A *Copying files, please wait* window appears.

2 When the window closes, the software files are successfully copied into the generics directory on your PC. By default, this directory is **`C:\Program Files\Alcatel-Lucent\WaveStar CIT\generics\DMX\9.1.0\p`**, however, the actual directory is determined by the path defined in Step 10 of Procedure 14-1.1: “ Install *WaveStar*® CIT software on your PC” (p. 14-9).

3 Do you wish to install the *WaveStar*® CIT software?

If...	Then...
WaveStar®	Proceed to Procedure 14-1.1: “ Install *WaveStar*® CIT software on your PC” (p. 14-9).
No	Stop! End of Procedure.

END OF STEPS

Procedure 14-2: Connect Personal Computer (PC) and establish *WaveStar*® CIT session

Overview

Use this procedure to connect PC and establish a *WaveStar*® CIT session.

Required equipment

At least one of the following cables is required:

- RS-232 cable with an RJ-45 connector on one end and a PC serial connector on the other (typically DB9) for the **RS232** port.
- CAT5 Ethernet straight-through or a cross-over cable for the **LAN** port. If you are connecting the PC directly to the NE, use the LAN 10Base-T cross-over cable. If you are connecting the PC directly to a hub, use the LAN 10Base-T straight-through cable.

For detailed cabling information, refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Installation Manual, 365-372-304*.

Important! You must be a member of either the Administrator Group or the Power User Group on your PC to establish a *WaveStar*® CIT session.

This procedure assumes that TCP/IP and OSI connectivity has been established to the required network elements in the network.

Before you begin

Prior to performing this procedure:

1. Refer to Procedure 14-1: “Install software on the PC” (p. 14-4).
2. Refer to “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.
3. If *WaveStar*® CIT logins were enabled during installation, obtain a valid user ID and password for the *WaveStar*® CIT.
4. Obtain a valid user ID and password for the required network element.
5. Obtain the Target Identifier (TID)/NE name of the network element that you are establishing a *WaveStar*® CIT session with.
6. If establishing a *WaveStar*® CIT session with a network element using TCP/IP protocol, obtain the required IP address of the network element or gateway network element (if applicable).
7. If establishing a *WaveStar*® CIT session with a network element using OSI protocol, obtain the required NSAP address of the network element (if applicable). Also refer to the *CIT OSI Neighbors* view and *Address List* from the *WaveStar*® CIT Network View.

Steps

Complete the following steps to connect PC and establish a session.

1 Connect your PC (using the appropriate cable[s]) to at least one of the following ports:

- **RS232** serial port on the faceplate of the SYSCTL circuit pack to an available COM port (COM1 or COM2) of the PC
- **LAN** port on the faceplate of the SYSCTL circuit pack to the NIC card of PC. If you are connecting the PC directly to the NE, use the LAN 10Base-T cross-over cable. If you connecting the PC to a hub, use the LAN 10Base-T straight-through cable.
- **J16 IAO LAN** port on the rear of the Alcatel-Lucent 1665 DMX shelf to the NIC card of PC. If you are connecting the PC directly to the NE, use the LAN 10Base-T cross-over cable. If you are connecting the PC to a hub, use the LAN 10Base-T straight-through cable.

  Important! You can be connected simultaneously to both the **RS232** and the front **LAN** or the rear **J16 IAO LAN**.

  If you are uncertain that the LAN ports have already been provisioned, connecting via the serial port is recommended.

2 Start the *WaveStar*® CIT software on the PC by double-clicking on the *WaveStar*® CIT icon on your desktop (created by the installation procedure).

Figure 14-1 *WaveStar*® CIT welcome window

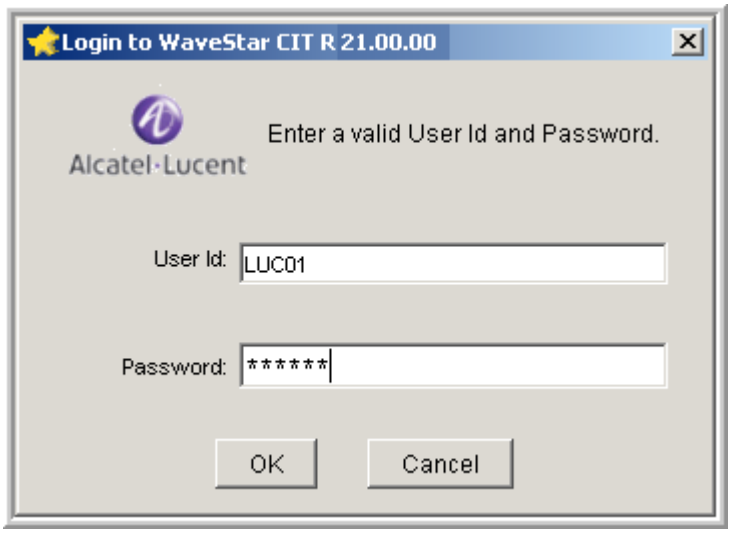


Rxx.xx.xx in the figure represents the *WaveStar*® CIT release number, for example R24.00.00.

3 **Important!** If you selected **Disable WaveStar CIT logins** during the *WaveStar*® CIT installation, you do not have to log in to the *WaveStar*® CIT. You will see either the Network Card selection screen (if you have more than one NIC card on your PC) or the *WaveStar*® CIT legal notice. Figure 14-3, “Legal notice” (p. 14-31).

Enter a valid User ID and password in the *WaveStar*® CIT Login window and click **OK**.

Figure 14-2 *WaveStar*® CIT login window



LUC01/LUC+01 and LUC02/LUC+02 are the default user IDs/passwords for the *WaveStar*® CIT. It is highly recommended that you change these user IDs and passwords during your first session to preserve the security of your equipment. To change your *WaveStar*® CIT password, select **Administration** → **Change Password** from the *WaveStar*® CIT Network View.

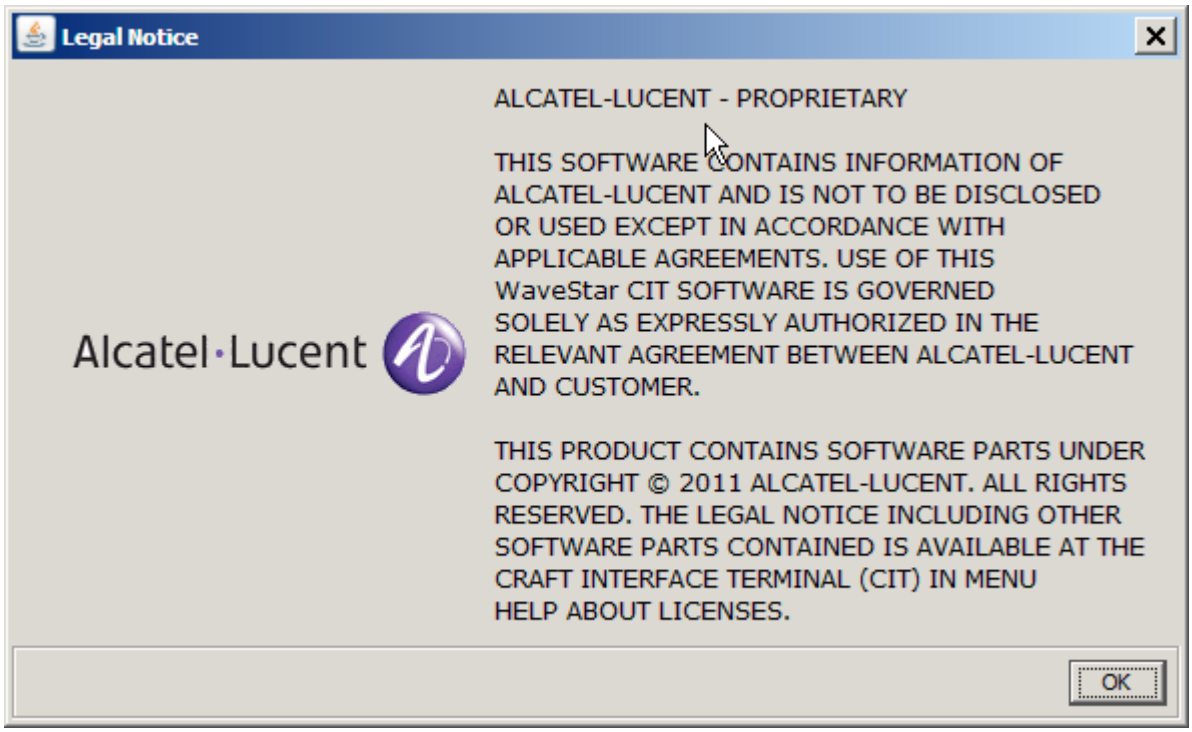
User IDs must adhere to the guidelines listed in "User ID guidelines" (p. 7-11).

Passwords must adhere to the guidelines listed in "Password guidelines" (p. 7-11).

Important! If this is the first time you are launching the *WaveStar*® CIT after a new installation or a modification, AND you have more than one Network Card on your PC, you may be asked to select the Network Card you wish to use to connect to the NE.

Result: The Legal Notice appears. (Refer to the following figure.)

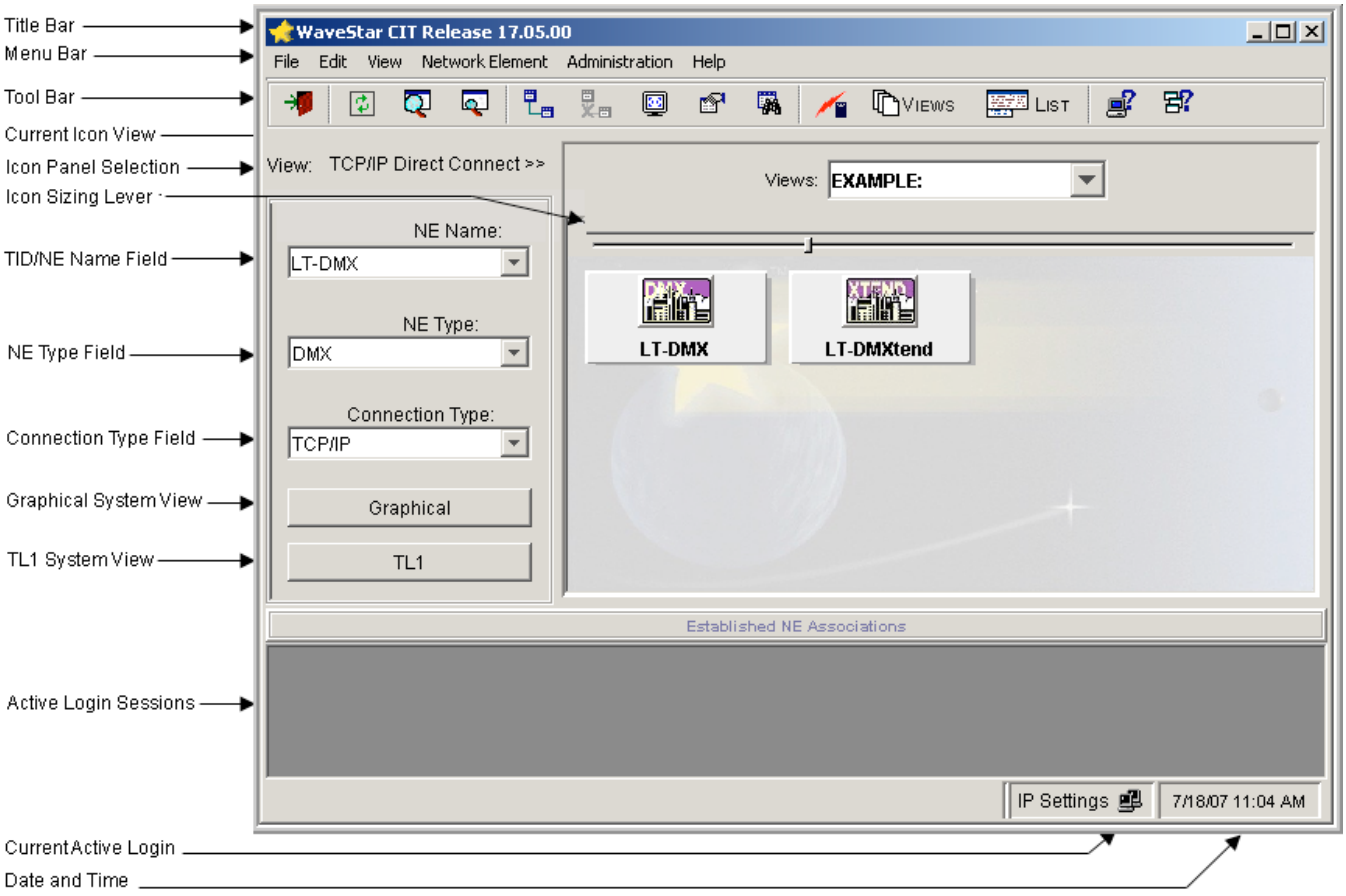
Figure 14-3 Legal notice



4 Read the Legal Notice and click **OK**.

Result: The Network View window opens. (Refer to the following figure. If your PC is running a different version of *WaveStar*® CIT software, there may be some differences between the screen shown in the following figure and what is displayed on your PC.)

Figure 14-4 Example of network view



5 Enter the NE name/TID of the shelf that you wish to communicate with in the **NE Name:** field. If you have previously established communications with the NE from this *WaveStar*® CIT, click on the drop-down arrow and select the appropriate NE from the list.

6 In the **NE Type:** field, click on the drop-down arrow and select DMX.

7 In the **Connection Type**: field, click on the drop-down arrow and select the appropriate connection type.

- *Serial* should be selected if you are connected locally to the serial **RS232** port on the SYSCTL circuit pack. To establish a *WaveStar*® CIT session to a remote network element, you must have DCC connectivity. Also refer to the *WaveStar*® CIT *CIT OSI Neighbors* view and *Address List*. See the information in "Before you begin" (p. 14-27).
- *OSI* should be selected if
  - you are connected locally to LAN-1, the front **LAN** port on the SYSCTL circuit pack, OR LAN-2, the rear **J16 IAO LAN** port on the backplane, AND
  - the LAN port is provisioned to use OSI protocol

  To establish a *WaveStar*® CIT session to a remote network element, you must have DCC connectivity. Also refer to the *WaveStar*® CIT *CIT OSI Neighbors* view and *Address List*. See the information in "Before you begin" (p. 14-27).
- *TCP/IP* should be selected if
  - you are connected locally to LAN-1, the front **LAN** port on the SYSCTL circuit pack, OR LAN-2, the rear **J16 IAO LAN** port on the backplane, AND
  - the LAN port is provisioned to use TCP/IP protocol, AND
  - you know the IP address of the NE.

  To establish a *WaveStar*® CIT session to a remote network element, you must have network connectivity and the IP address of the remote network element or gateway network element.

  Important! An IP address must be assigned to the NIC card on the PC; otherwise, login problems may occur. To assign an IP address to the NIC card, start the DOS prompt on the PC and enter the **`ipconfig/all`** command. An IP address line should appear. If there is no IP address line or 0.0.0.0 for an IP address, then assign an IP address to the NIC card according to local procedures.

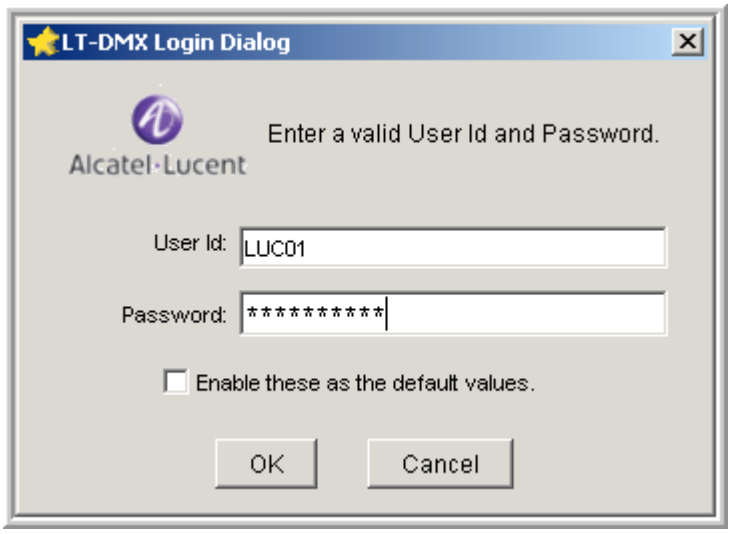
8 After completing the three fields, click on the **Graphical** button.

If you select the TCP/IP option, you must also enter the IP address of your NE and then click **OK**.

Important! All procedures in this manual assume that the Graphical button is used. However, the **TL1** button can be selected to communicate directly with the network element using the TL1 Cut Through interface.

9 An NE Login screen appears.

Figure 14-5 NE login



Enter a valid User ID and password to log in to the NE:

By selecting the **Enable these as the default values** checkbox, you will be able to reconnect to this NE without entering the User ID and Password. However, if you attempt to connect to a different NE that does not have the same User ID and password, the connection will fail and you will be prompted to enter a valid User ID and password. The User ID and Password are stored for the duration of the CIT session and must be re-entered when the CIT is restarted.

> **Important!** LUC01, LUC02, and LUC03 are the default privileged user IDs and DMX2.5G10G is the default privileged password for Alcatel-Lucent 1665 DMX. It is highly recommended that you change all three user IDs and passwords during your first session to preserve the security of your equipment.
>
> To change your network element password, refer to Procedure 7-2: “Change your own password” (p. 7-10).

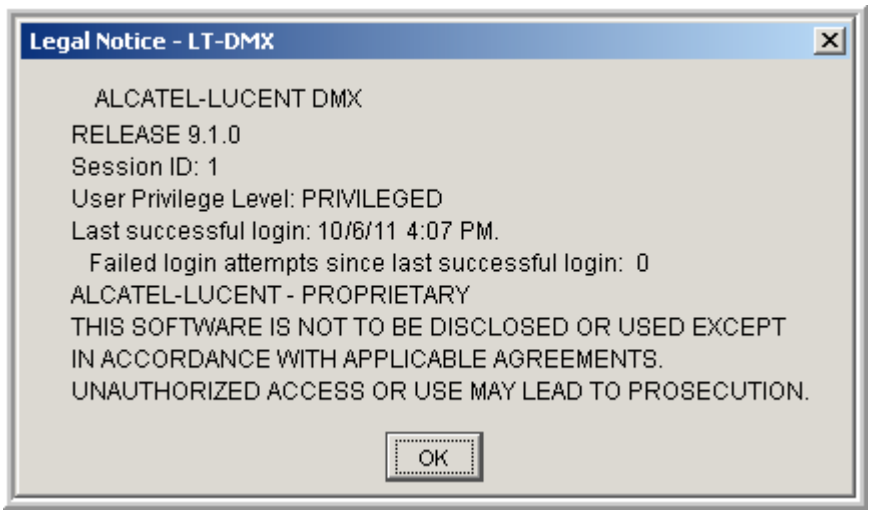
10 If the login is successful, the NE Legal Notice screen appears.

If the login is *not* successful, try one of the following:

- If you are connected locally to the **RS232** serial port, check cable connections. Check COM port baud rate settings by selecting **Administration** → **Serial COM Selection** from the *WaveStar*® CIT Network View. Try different COM port settings. The NE default baud rate setting for the **RS232** serial port (cit-1) is 9600. The rate of the COM port must match the rate of the CIT port on the NE.
- If you are connected locally to LAN-1 or LAN-2 and using the OSI protocol, check your network card (NIC) settings. Some NIC cards have an 802.1b option which must be enabled for OSI to work.
- If you are connected locally to LAN-1 or LAN-2 and using the TCP/IP protocol, make sure you are entering the correct TCP/IP address.

  Important! Your NE software Release number and User Privilege Level may be different. Your screen should be similar to Figure 14-6, "NE level legal notice" (p. 14-35).

Figure 14-6 NE level legal notice



11 Read and observe the software Release (for example, 9.1.0), and the User Privilege Level (for example, **Privileged**). Click **OK** to continue.

Important! The date and time of the last successful login and the number of unsuccessful login attempts are displayed.

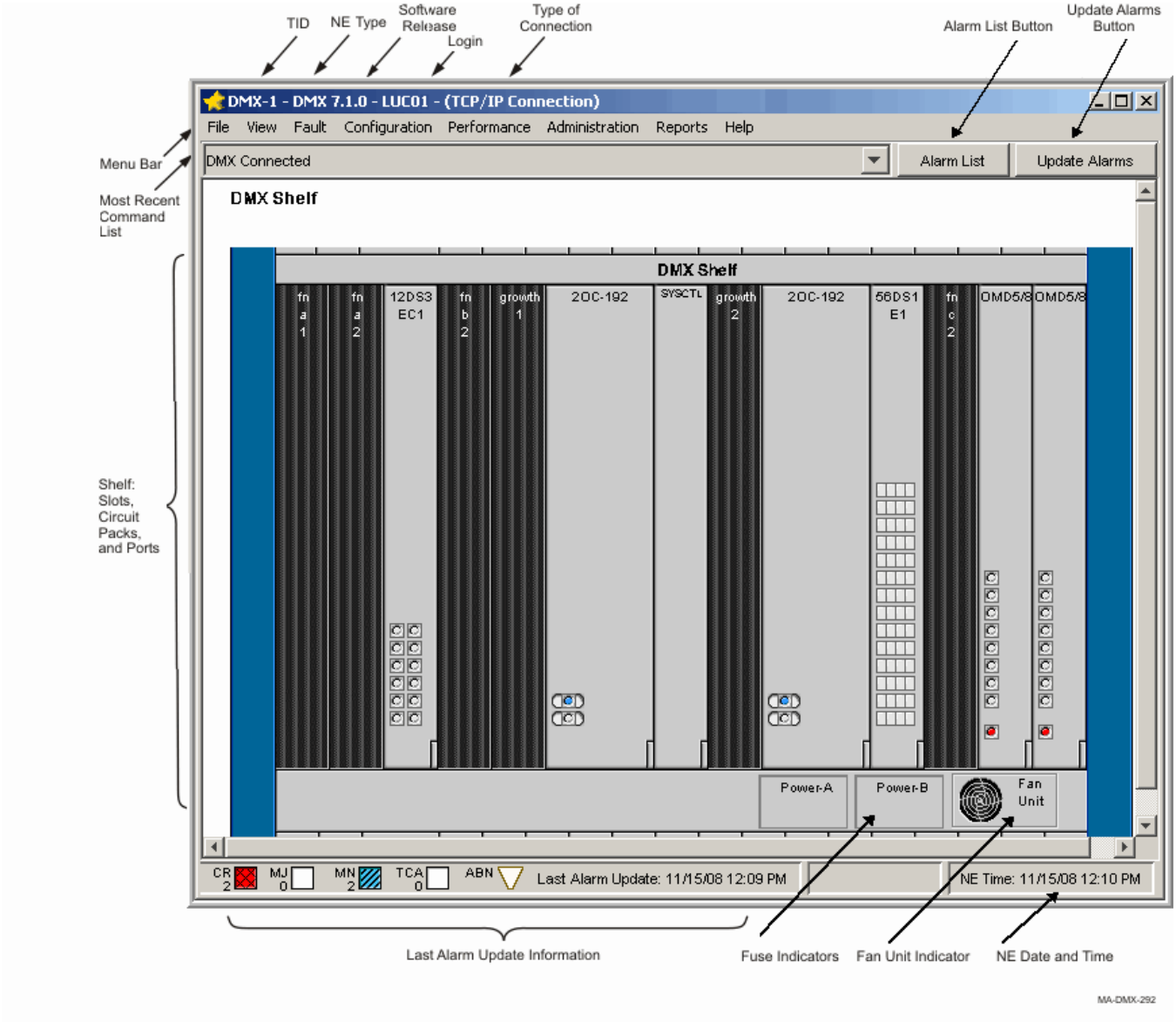
Result: The *WaveStar*® CIT System View window opens.

12 Familiarize yourself with the different aspects of the graphical presentation of the shelf, including the toolbars, and status indicators.

The *WaveStar*® CIT is designed to Microsoft *Windows*® standards.

The *WaveStar*® CIT System View has a menu bar at the top of the screen, and status indicators at the bottom of the screen. Each item on the menu bar has pull-down menus and submenus, refer to Figure 14-7, "Example of system view (graphical)" (p. 14-36).

Figure 14-7 Example of system view (graphical)



13 It is recommended that you create a View List for future convenience. From the *WaveStar*® CIT Network View window (*NOT* the System View window), select **Administration** → **Administer Views**. Click on the **Help** button and use the information

on that screen to create a View List.

END OF STEPS

Procedure 14-3: Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)

Overview

This procedure describes the Alcatel-Lucent recommended method for the cleaning and inspection of optical connectors using specific tools and materials that have been proven to be effective in the assembly and testing of optical transmission equipment.

Required equipment

The following table lists required and recommended equipment for proper cleaning:

Product	Model/ Description	Comcode	ITE #	Installation Order #
Optical Fiber Scope	Noyes OFS 300-200X	408197028	ITE-7129	33712900
2.5mm Universal adapter cap	For use with the Noyes OFS 300-200X	408197044	ITE-7129D1	33712901
1.25mm Universal adapter cap	For use with the Noyes OFS 300-200X	408197069	ITE-7129D2	33712902
Video Fiber Scope*	Noyes VFS-1	408552271	ITE-7187	TBD
CLETOP Cleaning Cassette	Type A Reel	901375154	ITE-7137	33713700
CLETOP Cleaning Cassette Replacement Reel	Type A Reel	901375014	ITE-7137 D1	33713701
Luminex Stick port cleaners	1.25 mm	901375030	ITE-7134	33713400
Luminex Stick port cleaners	2.5 mm	901375022	ITE-7135	33713500
Luminex Cloth	5.5" x 5.5"	408201226	R6033	23603300

* This equipment may not be necessary at all locations. It is to be used when the ports need to be verified for cleanliness. If care is exercised when cleaning fibers, the video scope may not be needed.

Note: The equipment and material listed above has been tested and proven effective when used in conjunction with this procedure. Substitution of equipment or materials is at the discretion of the user and is not recommended.

Related information

A course on connector cleaning and the connector inspection process is now offered through Alcatel-Lucent University, Course Code: LMC214H *Fiber Optic Inspection and Cleaning*. To learn more about this course, consult your local Alcatel-Lucent Account Representative.

The procedure that follows utilizes the *Dry* method for connector cleaning. This method utilizes a dry double clean wipe using the CLETOP cleaning cassette.

This procedure is recommended for connector ferrules 2.5 mm and 1.25 mm in diameter associated with LC connectors. The ferrule of a fiber optic connector consists of a ceramic or stainless steel cylinder with a hole located longitudinally down the center of its axis, allowing enough tolerance for a fiber to pass through.

All optical connectors should be cleaned prior to being connected. Keep the protective ferrule dust cap on the connector until initiating the cleaning process.

Important! It is critical that connector faces are clean and free from particular contamination to assure proper performance and reliability of lightwave systems. With the modern high-speed, high-power, and wider-bandwidth optical transmission systems, clean connectors along the optical path are essential for successful operation.

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.

Steps

Refer to the following supporting elements to complete this procedure.

1 To clean the optical fibers, refer to Procedure 14-3.1: "Clean optical fibers" (p. 14-40).

2 To clean the fiber adapters and LBOs, refer to Procedure 14-3.2: "Clean fiber adapters and circuit pack connectors" (p. 14-43).

3 To inspect the optics following cleaning, refer to Procedure 14-3.3: "Optical fiber and connector inspection" (p. 14-44).

END OF STEPS

Procedure 14-3.1: Clean optical fibers

Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38).

Use this procedure to clean optical fibers.

Steps

The following cleaning procedure is acceptable for field service/installation activities.

1 Remove the dust cap from the connector ferrule, thus exposing the connector endface.

2 If a CLETOP cassette cleaner is not available, proceed to Step 6. Otherwise, hold the CLETOP cassette cleaner in the palm of your hand with the cassette shutter door facing up.

Rotate the cassette lever all the way down with your thumb. Do not release the lever. The lever advances the "dry" Luminex cleaning cloth inside the case and simultaneously opens the shutter. The CLETOP cassette shutter door is now open and ready for cleaning the connector.



3 Insert and press the connector ferrule endface perpendicular against the cleaning cloth in the first of two slots of the cleaner.

Drag it down (in the direction indicated by the arrows on the cleaner). Make certain not to release the lever of the cassette.

4 Lift the connector from the first slot and rotate it 90 degrees and repeat the downward motion using the second slot. Be sure the ferrule is pressed snug against the cleaning cloth while dragging the ferrule to assure the proper cleaning action.

5 Release the cassette lever allowing the shutter door to close to its initial position. Proceed to Step 7.

6 Wrap a Luminex cleaning cloth around the ferrule and rotate the connector housing, cleaning the outside periphery of the ferrule.

Follow this by folding an unused portion of the cloth over the end of the ferrule endface and then with light pressure from the thumb, slightly drag the cloth from the center of the ferrule to the edge while rotating the connector 360 degrees. If the Luminex cleaning cloth is not available, a cleanroom optic wipe can be used. The Luminex cleaning cloth is washable and can be used multiple times; optic wipes are single use and disposable.

7 Inspect the connector for cleanliness. If necessary, repeat the cleaning process.

Reference: Procedure 14-3.3: “Optical fiber and connector inspection” (p. 14-44)

END OF STEPS

Procedure 14-3.2: Clean fiber adapters and circuit pack connectors

Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38).

Use this procedure to clean fiber adapters and circuit pack connectors.

Important! Do not attempt to clean ports equipped with yellow lightguide buildout (LBO) attenuators. Attenuators contain a thin glass lens that is extremely fragile. The LBO will be damaged if cleaned using this method.

Steps

Complete the following steps to clean the optical buildout adapter or the circuit pack connector.

1 Insert the appropriate CLETOP stick cleaner (2.5 mm for SC, ST, and FC connectors, 1.25 mm for LC connectors) into the adapter rotating the stick 360 degrees while inserting. Push/rotate stick until the stick cleaner makes contact with the connector. Apply slight pressure upon contact and rotate stick 360 degrees at least three (3) times.

2 Remove the stick cleaner rotating it upon removal.

3 Using a dry CLETOP stick cleaner of appropriate diameter, repeat the above cleaning procedure. This procedure will clean the side walls of the adapter and the endface of the circuit pack connector.

4 Gently insert the Video Fiber Scope probe into the port until the fiber ferrule comes into view.

Reference: Procedure 14-3.3: "Optical fiber and connector inspection" (p. 14-44)

5 Verify that the fiber ferrule is clean. Repeat Step 1 through Step 3 if the fiber does not meet the requirements specified.

END OF STEPS

Procedure 14-3.3: Optical fiber and connector inspection

Overview

Important! This is *not* a stand-alone procedure. Perform this procedure only as directed by Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38).

Use this procedure to inspect fiber adapters and circuit pack connectors following cleaning.



WARNING

Laser hazard

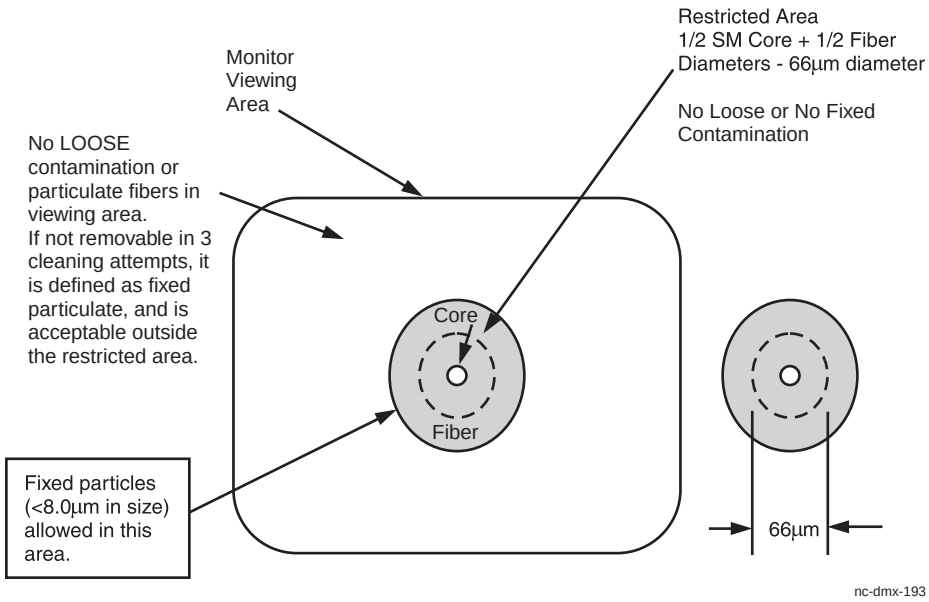
When using an optical power meter to verify the connector and fiber to be clean, take special precaution to make sure that no power is being emitted from the fiber before viewing.

Steps

After cleaning the connector, inspect the ferrule endface to ensure that it is free from any particulate contamination using an optical fiber inspection scope of at least 200X magnification. When using an optical fiber scope (for example, the Noyes OFS 300-200X) exercise extreme caution to assure that the fiber being examined is de-energized.

1 Follow the instructions in the manual provided with the Optical Fiber Scope to view the ferrule endface of the fiber under inspection.

2 The visual area of the ferrule endface (ferrule and fiber) as observed by the inspection system/scope should be free of any contaminates.



Repeat the Cleaning Procedure if the fiber endface does not meet the following requirements:

- No fixed type of contamination (contaminates that remain at the same location after 3 wet-dry cleaning cycles), regardless of size, is allowed in the restricted area of the glass fiber endface.

  Important: The restricted area is defined as ~66 microns (mm) diameter for both singlemode and multimode fibers.
- No chips, cracks or scratches are allowed near the core of the glass fiber endface.
- No large floating (loose) contaminates are allowed on the glass fiber and ceramic ferrule endface.

3 After the connector has been verified to be cleaned, it should be immediately inserted into the adapter buildout of the optical component. This will assure maximum cleanliness and effectiveness of the connector.

4 If the cleaned connector cannot be immediately connected to a corresponding adapter, the connector ferrule must be protected with a connector dust cap. Before placing the cap on the ferrule, make sure the cap is clean. This can be accomplished by inserting a CLETOP stick cleaner (swab) of the same inside diameter as the cap (either 2.5 or 1.25 mm) and rotate the stick 360 degrees three (3) times. Following this procedure, carefully place the cap over the ferrule. When the cleaned connector is ready for assembly, it should be

re-inspected for cleanliness prior to connection.

END OF STEPS

Procedure 14-4: Perform connection and verification of optical facility

Overview

Use this procedure to connect and verify an optical facility.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 14-3), the following equipment is also required:

- Lightguide Jumpers
- Lightguide Buildouts (LBOs).
- Optical Power Meter

LC-type lightguide buildouts

The following lightguide buildouts are required for attenuating the OLIU optical ports. Lightguide buildouts are not required for Optical Transport System (OTS) and Optical Channel (OCH) ports.

Product Code	Comcode	Loss (dB)	Fiber Type	Color
ABLCS-05.0	108279381	5	SM	Yellow
ABLCS-10.0	108279431	10	SM	Yellow
ABLCS-15.0	108279480	15	SM	Yellow
ABLCS-20.0	108279530	20	SM	Yellow

Single-mode lightguide jumpers

The following single-mode lightguide angled boot jumpers are available for connecting the optical ports to the optical span.

Product Code	Comcode	Length (ft.)	Connectors
MS1A40LC-A40LC-2	108918269	2	LC-LC
MS1A40LC-A40LC-4	108918707	4	LC-LC

Product Code	Comcode	Length (ft.)	Connectors
MS1A40LC-A40LC-E/W	108918715	Customer Specified	LC-LC
MS1A40LC-LC-2	108918830	2	LC-LC
MS1A40LC-LC-4	108918855	4	LC-LC
MS1A40LC-LC-6	108918863	6	LC-LC
MS1A40LC-LC-8	108918871	8	LC-LC
MS1A40LC-LC-10	108918889	10	LC-LC
MS1A40LC-LC-15	108918897	15	LC-LC
MS1A40LC-LC-20	108918913	20	LC-LC
MS1A40LC-LC-25	108918921	25	LC-LC
MS1A40LC-LC-30	108918939	30	LC-LC
MS1A40LC-LC-35	108918947	35	LC-LC
MS1A40LC-LC-40	108918962	40	LC-LC
MS1A40LC-LC-50	108918970	50	LC-LC
MS1A40LC-LC-E/W	108918988	Customer Specified	LC-LC
MS1A40LC-SC-2	108919002	2	LC-SC
MS1A40LC-SC-4	108919010	4	LC-SC
MS1A40LC-SC-6	108919028	6	LC-SC
MS1A40LC-SC-8	108919036	8	LC-SC
MS1A40LC-SC-10	108919044	10	LC-SC
MS1A40LC-SC-15	108919051	15	LC-SC
MS1A40LC-SC-20	108919069	20	LC-SC
MS1A40LC-SC-25	108919077	25	LC-SC
MS1A40LC-SC-30	108919085	30	LC-SC
MS1A40LC-SC-35	108919093	35	LC-SC
MS1A40LC-SC-40	108919101	40	LC-SC
MS1A40LC-SC-50	108919119	50	LC-SC
MS1A40LC-SC-E/W	108919996	Customer Specified	LC-SC
MS1A40LC-FC-2	108918723	2	LC-FC
MS1A40LC-FC-4	108918731	4	LC-FC

Product Code	Comcode	Length (ft.)	Connectors
MS1A40LC-FC-6	108918749	6	LC-FC
MS1A40LC-FC-8	108918756	8	LC-FC
MS1A40LC-FC-10	108918764	10	LC-FC
MS1A40LC-FC-15	108918772	15	LC-FC
MS1A40LC-FC-20	108918780	20	LC-FC
MS1A40LC-FC-25	108918798	25	LC-FC
MS1A40LC-FC-30	108918806	30	LC-FC
MS1A40LC-FC-35	108918814	35	LC-FC
MS1A40LC-FC-40	108918822	40	LC-FC
MS1A40LC-FC-50	108918848	50	LC-FC
MS1A40LC-FC-E/W	108918905	Customer Specified	LC-FC
MS1A40LC-EP-2	108919713	2	LC-ST
MS1A40LC-EP-4	108919721	4	LC-ST
MS1A40LC-EP-6	108919739	6	LC-ST
MS1A40LC-EP-8	108919747	8	LC-ST
MS1A40LC-EP-10	108919754	10	LC-ST
MS1A40LC-EP-15	108919770	15	LC-ST
MS1A40LC-EP-20	108919788	20	LC-ST
MS1A40LC-EP-25	108919796	25	LC-ST
MS1A40LC-EP-30	108919804	30	LC-ST
MS1A40LC-EP-35	108919812	35	LC-ST
MS1A40LC-EP-40	108919820	40	LC-ST
MS1A40LC-EP-50	108919838	50	LC-ST
MS1A40LC-EP-E/W	108919846	Customer Specified	LC-ST

Important! The single-mode angled boot lightguide jumpers used to connect the optical ports must be equipped with LC connectors.

Allowable optical receiver power ranges

The following information is required to determine the required LBO for the OLIU OC-n lines.

Optics	Circuit Pack	Allowable Receiver Range (dBm)
Long Reach (LR) Optics	LNW26B OC-48 LNW27 OC-48 LNW28 OC-48 LNW29 OC-48 LNW32 OC-48 LNW121B–159B OC-48 LNW221–259 OC-48 LNW421–LNW459 OC-48	−8.0 to −29.0
	LNW36 OC-3	0.0 to −34.0
	LNW46 OC-12	−7.0 to −30.5
	LNW50 OC-12	−7.0 to −30.5
	LNW54 OC-12	−8.0 to −29.0
	LNW60 OC-192	−7.0 to −24.0
	LNW57 OC-192	−7.0 to −24.0
	LNW555 OC-192	−9.0 to −22.0
	OM155 1.3LR1	−10.0 to −34.0
	OM622 1.3LR1	−8.0 to −28.0
	OM622 1.5LR2	
	OM2.5G 1.3LR1	−9.0 to −27.0
	OM2.5G 1.5LR2	−9.0 to −28.0
	OM10G 1.5LR2	−7.0 to −24.0

Optics	Circuit Pack	Allowable Receiver Range (dBm)
Intermediate Reach (IR) Optics	LNW31 OC-48 LNW77 OC-48	0.0 to −18.0
	LNW48 OC-12	−8.0 to −28.0
	LNW56 OC-192 LNW523 OC-192 LNW527 OC-192 LNW554 OC-192	−1.0 to −14.0
	OM155 1.3IR1	−8.0 to −28.0
	OM622 1.3IR1	−8.0 to −28.0
	OM10G 1.5IR2	−1.0 to −14.0
Short Reach (SR) Optics	LNW76 OC-48	−3.0 to −18.0
	LNW58 OC-192	−1.0 to −11.0
	OM155 1.3SR1	−8.0 to −23.0
	OM2.5G 1.3SR1	−3.0 to −18.0
	OM10G 1.3SR1	−1.0 to −11.0

Important! Avoid excessive bending of the optical jumper used to loop the optical port on itself.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 14-3) in this chapter.
2. Refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.
3. Verify that the correct lightguide build-outs and jumpers are available.
4. Ensure all optical fiber connectors and couplings have been properly cleaned. Signal performances may be degraded if the connections and couplings are not cleaned properly.
   Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)
5. Ensure that technicians are available at both ends of the optical span(s).
6. Obtain the work instructions for this procedure.

Steps

Complete the following steps to connect and verify an optical facility.

1 At the near-end Alcatel-Lucent 1665 DMX, connect personal computer and establish *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

2 Dress optical cables in the fiber tray at bottom front of the shelf.

3 Route the optical jumpers from the bottom of the shelf. See "Single-mode lightguide jumpers" (p. 14-47).

4 Establish communication with technician at other end of the optical span.

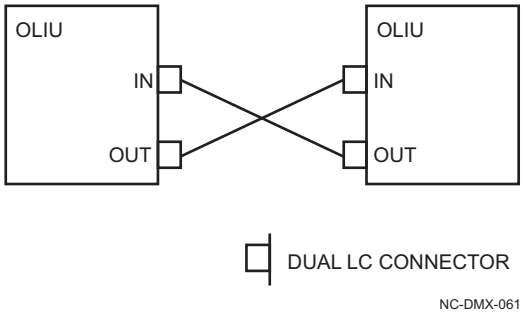
5 At both ends of the optical span, remove protective covers from receive and transmit optical jumper cables and clean LC connectors.

Important! The Alcatel-Lucent 1665 DMX OLIU and DWDM circuit packs require single-mode lightguide cable.

Single-mode optical fibers connecting this shelf with the far-end shelf should not be connected to the circuit pack until at least 45 seconds after an optical loopback is removed. It may take from 15 seconds to 3.5 minutes for the circuit pack **FAULT** LED or port LED associated with the pluggable transmission module to stop flashing after the cables are connected, depending on the setting of the signal degrade threshold.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

6 At both ends of the optical span, ensure that only the dual LC adapter is installed on the circuit pack (no LBOs). The following figure shows an example with OLIU circuit packs.



7 **Important!** Optical connections should be made in the following sequence to speed up the detection of looped-back or crossed-over cables/jumpers.

At Node 1 of the optical span, connect the optical fiber transmit cables to the port **OUT** connectors.

8 **Important!** LBOs are not required on the OTS ports.

If connecting...	Then...
DWDM OTS ports,	Proceed to Step 11.
DWDM OTU2 ports,	Continue with Step 9.
OLIU ports,	

9 At Node 2 of the optical span, measure the optical power of the optical fiber receive cable using an optical power meter.

For the allowable receiver power ranges, refer to the "Allowable optical receiver power ranges " (p. 14-50) in this procedure. Select the appropriate LBO to build out to the middle of the range.

10 Install the LBO assembly at the port **IN** connector of Node 2.

Reference: Procedure 14-5: "Install/remove LC lightguide buildouts (LBOs)" (p. 14-56)

11 At Node 2, connect the input optical fiber to the proper port **IN** connector and LBO (if equipped).

Result: It may take from 15 seconds to 3.5 minutes for the circuit pack **FAULT** LED or port LED associated with the pluggable transmission module to stop flashing after the cables are connected, depending on the setting of the signal degrade threshold.

12 Did the flashing circuit pack **FAULT** LED or port LED associated with the pluggable transmission module go off at Node 2?

If...	Then...
No	Click the **Alarm List** button to obtain the *NE Alarm List*. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear/isolate the trouble.
Yes	Continue with Step 13.

13 At Node 2 of the optical span, connect the optical fiber transmit cables to the port **OUT** connector.

14 **Important!** LBOs are not required on the OTS ports.

If connecting...	Then...
DWDM OTS ports,	Proceed to Step 17.
DWDM OTU2 ports,	Continue with Step 15.
OLIU ports,	

15 At Node 1 of the optical span, measure the optical power of the optical fiber receive cable using an optical power meter.

For the allowable receiver power ranges, refer to the "Allowable optical receiver power ranges " (p. 14-50) in this procedure. Select the appropriate LBO to build-out to the middle of the range.

16 Install the LBO assembly at the port **IN** connector of Node 1.

Reference: Procedure 14-5: "Install/remove LC lightguide buildouts (LBOs)" (p. 14-56)

17 At Node 1, connect the input optical fiber to the proper port **IN** connector and LBO (if equipped).

Result: It may take from 15 seconds to 3.5 minutes for the circuit pack **FAULT** LED or port LED associated with the pluggable transmission module to stop flashing after the cables are connected, depending on the setting of the signal degrade threshold.

18 Did the flashing circuit pack **FAULT** LED or port LED associated with the pluggable transmission module go off at Node 1?

If...	Then...
No	Click the **Alarm List** button to obtain the *NE Alarm List*. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear/isolate the trouble.
Yes	Continue with Step 19.

19 Disconnect the fiber cable from the **OUT** connector on the port at one end of the span. At the other end, verify that the associated circuit pack **FAULT** LED or port LED associated with the pluggable transmission module is flashing, indicating a loss of signal. Reconnect the fiber and repeat the process for the other direction of transmission.

20 If required, select **Administration** → **OSI Routing Map** and **Administration** → **OSI Neighbor Maps** to retrieve maps of the network. Verify that nodes have been connected properly and that they can communicate with each other.

21 After all connections and tests have been made, verify optical fiber cables are placed correctly in fiber tray and properly routed in bay framework.

END OF STEPS

Procedure 14-5: Install/remove LC lightguide buildouts (LBOs)

Overview

Use this procedure to install or remove an LC lightguide buildout (LBO).

Before you begin

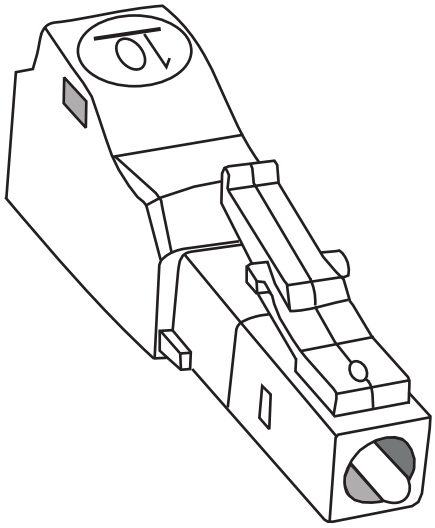
Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to install or remove an LC lightguide buildout (LBO).

1 Remove the protector caps and plugs (if equipped) from the LC LBO and the dual adapter on the circuit pack, and store them in a clean container.



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2 Is LC LBO being installed or removed?

IF the LC LBO is being...	Then...
Installed,	Continue with Step 3.
Removed,	Proceed to Step 6.

3 **Important!** All LC LBOs should be cleaned before making initial connections or reconnections. Only the components being assembled at this time should be cleaned.

Clean the LC LBO.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

4 Align the LBO with the slot in the adapter, depress locking tab, and push the LBO into the dual adapter until a click is heard. The LBO is now locked into position.

5 STOP! End of Procedure.

6 **Important!** The locking tab must only be pushed along a line perpendicular to the LBO body in the direction towards the LBO in order to avoid damage to the locking tab.

Depress the locking tab on the LBO and pull the LBO out of the dual adapter.

END OF STEPS

Procedure 14-6: Connect OLIU optical loopbacks

Overview

Use this procedure to loop back an *out-of-service* optical line at the OLIU faceplate connectors. Optical lines can also be looped back at the LGX equipment to verify correct fiber installation and labeling.

Important! LBOs are installed on the OLIU faceplate **IN** connector only.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 14-3), one lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269) for each optical line to be looped back (LC-type connections) is also required.

The following lightguide buildouts (LBOs) are required.

- 5-dB loss LBO (code ABLCS-05.0: comcode 108279381) or
- 10-dB loss LBO (code ABLCS-10.0: comcode 108279431) or
- 15-dB loss LBO (code ABLCS-15.0: comcode 108279480) or
- 20-dB loss LBO (code ABLCS-20.0: comcode 108279530)

Before you begin

Prior to performing this procedure:

1. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
2. Obtain the work instructions for this procedure.

Steps

Complete the following steps to loop back an *out-of-service* optical line at the OLIU faceplate connectors.

1 Obtain the correct LBO and lightguide jumper:

If the OLIU is...		Then obtain a...
Long Reach (LR) Optics	LNW36 OC-3	lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269) and a **10-dB** LBO (code ABLCS-10.0, comcode 108279431 for LC connectors)
	LNW26B OC-48 LNW27 OC-48 LNW28 OC-48 LNW29 OC-48 LNW32 OC-48 LNW121B–159B OC-48 LNW221–259 OC-48 LNW421–459 OC-48	lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269) and a **15-dB** LBO (code ABLCS-15.0, comcode 108279480 for LC connectors)
	LNW46 OC-12 LNW50 OC-12	
	LNW54 OC-12 LNW555 OC-192 LNW57 OC-192 LNW60 OC-192 OM155 1.3LR1 OM622 1.3LR1 OM622 1.5LR2 OM2.5G 1.3LR1 OM2.5G 1.5LR2 OM10G 1.5LR2	lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269) and a **20-dB** LBO (code ABLCS-20.0, comcode 108279530 for LC connectors)

If the OLIU is...		Then obtain a...
Intermediate Reach (IR) Optics	LNW31 OC-48 LNW48 OC-12 LNW56 OC-192 LNW77 OC-48 LNW523 OC-192 LNW527 OC-192 LNW554 OC-192 OM155 1.3IR1 OM622 1.3IR1 OM10G 1.5IR2	lightguide jumper (MS1A40LC-A40LC-2, Comcode 108918269) and a **5-dB** LBO (code ABLCS-05.0, comcode 108279381 for LC connectors)
Short Reach (SR) Optics	LNW76 OC-48 LNW58 OC-192 OM155 1.3SR1 OM2.5G 1.3SR1 OM10G 1.3SR1	No LBO required (attenuation not needed)

2 If required, remove the optical line connections from the OLIU faceplate. Make a record of these disconnections so they can be replaced.

3 Remove the LBO (if equipped) from the **IN** connector of the OLIU faceplate. Make a note of the value.

Reference: Procedure 14-5: “Install/remove LC lightguide buildouts (LBOs)” (p. 14-56)

4 Remove the protector caps from the ends of the lightguide jumper (loopback cable).

5 **NOTICE**

Service-disruption hazard

Signal performance may be degraded if the connectors/adapters and fiber are not cleaned.

Ensure all optical fiber connectors/adapters and fiber are properly cleaned.

Clean the fiber connectors/adapters and fiber.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

6 **Important!** Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

If required, clean the pluggable transmission module(s).

Reference: Procedure 14-29: “Clean optical pluggable transmission module” (p. 14-141)

7 If required, remove the protective dust cover from the pluggable transmission module. Keep the dust cover clean until reinstalled later, if required.

8 Install the appropriate LBO on the **IN** connector, if required. The list of circuit packs and their corresponding LBOs may be found in Step 1.

Reference: Procedure 14-5: “Install/remove LC lightguide buildouts (LBOs)” (p. 14-56)

9 **Important!** The LBOs and lightguide jumpers connect to the LC-shielded, angled adapter on the OLIU faceplate.

Using the lightguide angled boot jumper (MS1A40LC-A40LC-2, Comcode 108918269), connect the **IN** connector and the corresponding **OUT** connector on the same OLIU.

Result: After a short time, the OLIU **FAULT** LED or port LED associated with the pluggable transmission module stops flashing. (It may take from 15 seconds to 3.5 minutes for the LED to stop flashing after the cables are connected, depending on the setting of the OC-n signal degrade threshold.) The **ACTIVE** LED remains on.

If OSI over DCC is enabled for the port, the **MJ** and **NE** LEDs on the SYSCTL circuit pack do *not* extinguish and the following alarms are reported.

- inconsistent DCC values
- section DCC channel failed

10 If responses are not as indicated, check connections and the lightguide jumper. Clean connections and repeat Step 9.

If responses are still not correct, click the **Alarm List** button to obtain the *NE Alarm List*. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear/isolate the trouble.

Reference:

- Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)
- Procedure 14-29: "Clean optical pluggable transmission module" (p. 14-141)

11 If required, repeat Step 1 through Step 10 to loop back additional optical lines.

END OF STEPS

Procedure 14-7: Perform end-to-end optical line test on Main OLIUs

Overview

Use this procedure to verify the integrity of a high-speed OC-n line.

Important! This test must be performed locally at each Alcatel-Lucent 1665 DMX shelf location associated with the optical span(s) being tested.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Important! It is assumed that each Alcatel-Lucent 1665 DMX node has passed the local (looped) transmission tests. If these tests have not been completed, refer to the appropriate procedure and perform the tests.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to verify the integrity of a high-speed OC-n line.

1 From the System View menu, select **Performance** → **View PM/Statistics Report** → **OCn Line**.

Result: The *OCn Line PM Report* window opens.

2 Expand the *CP main-1 (OCn)* circuit pack by clicking on the plus sign (+), select *Port 1 (OCn)*, and then click **Select**.

Result: The port performance monitoring parameters appear.

3 Provision the *Time Period* parameter **15 Min**, the *Monitored Date* parameter **Current Date**, the *Monitor Time* parameter **Current**, and the *Monitor Level* parameter **1-UP**. Then move all the *Near End Available Parameters* to *Selected Parameters* by clicking **Select All**. Click **Apply** to obtain the *OCn Line PM Report*.

Result: The *OCn Line PM Report* appears. The report should be empty, indicating no errors.

4 Wait 20 seconds and click **Refresh** on the *OCn Line PM Report* window. If a 15-minute boundary is crossed during the 20-second wait period, repeat this step.

Result: If the report is still empty, the optical span is error-free. Click **Close**.

5 Did report indicate any errors?

If...	Then...
Yes,	Continue with Step 6.
No,	Proceed to Step 7.

6 Trouble may be in optical and/or fiber connections. Trouble may also be in OLIUs. If report indicated trouble when the report was obtained from the near end of the span, trouble may be in the receive direction. If the report indicated trouble when the report was obtained from the far end of the span, trouble may be in the transmit direction. Check optical fiber and connections. Clean optical fiber connections.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

If no trouble was found in the optical fiber, click the **Alarm List** button to obtain the *NE Alarm List*. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear/isolate the trouble.

7 If required, repeat this procedure from Step 2 for the Main-2 OLIU; otherwise, click **Close**.

8 Have you retrieved error-free performance-monitoring reports from all shelf locations associated with the optical span(s) being tested?

If...	Then...
Yes,	STOP! End of Procedure.
No,	Repeat this procedure from Step 1 at the other shelf locations.

END OF STEPS

Procedure 14-8: Perform end-to-end optical line test on Function OLIUs

Overview

Use this procedure to verify the integrity of a low-speed OC-n line.

Important! This test must be performed locally at each Alcatel-Lucent 1665 DMX shelf location associated with the optical span(s) being tested.

Privilege level

You must log in as a Privileged, General, or Maintenance user to complete this procedure.

Important! It is assumed that each Alcatel-Lucent 1665 DMX has passed the local (looped) transmission tests. If these tests have not been completed, refer to the appropriate procedure and perform the tests.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to verify the integrity of a low-speed OC-n line.

1 From the System View menu, select **Performance** → **View PM/Statistics Report** → **OCn Line**.

Result: The *OCn Line PM Report* window opens.

2 Expand the appropriate low-speed OLIU circuit pack by clicking on the plus sign (+), select the required *Port n (OCn)*, and then click **Select**.

Result: The port performance monitoring parameters appear.

3 Provision the *Time Period* parameter **15 Min**, the *Monitored Date* parameter **Current Date**, the *Monitor Time* parameter **Current**, and the *Monitor Level* parameter **1-UP**. Then move all the *Near End Available Parameters* to *Selected Parameters* by clicking **Select All**. Click **Apply** to obtain the *OCn Line PM Report*.

Result: The *OCn Line PM Report* appears. The report should be empty, indicating no errors.

4 Wait 20 seconds and click **Refresh** on the *OCn Line PM Report* window. If a 15-minute boundary is crossed during the 20-second wait period, repeat this step.

Result: If the report is still empty, the optical span is error-free. Click **Close**.

5 Did report indicate any errors?

If...	Then...
Yes,	Continue with Step 6.
No,	Proceed to Step 7.

6 Trouble may be in optical and/or fiber connections. Trouble may also be in OLIUs or pluggable transmission modules. If report indicated trouble when the report was obtained from the near end of the span, trouble may be in the receive direction. If the report indicated trouble when the report was obtained from the far end of the span, trouble may be in the transmit direction. Check optical fiber and connections. Clean optical fiber connections.

Reference: Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38)

If no trouble was found in the optical fiber, click the **Alarm List** button to obtain the *NE Alarm List*. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear/isolate the trouble.

7 If required, repeat this procedure from Step 2 for the companion OLIU in the Function group; otherwise, click **Close**.

8 Have you retrieved error-free performance-monitoring reports from all shelf locations associated with optical line(s) being tested?

If...	Then...
Yes,	STOP! End of Procedure.
No,	Repeat this procedure from Step 1 at other shelf locations.

END OF STEPS

Procedure 14-9: Perform DS1/E1 transmission test

Overview

Use this procedure to test a DS1 or E1 port at a stand-alone Alcatel-Lucent 1665 DMX shelf or in a Alcatel-Lucent 1665 DMX network.

If this procedure is being used to perform end-to-end testing in a Alcatel-Lucent 1665 DMX network, it is assumed that the complete Alcatel-Lucent 1665 DMX network configuration (BLSR, UPSR, 1+1, Bidirectional 1+1, or Optimized 1+1) has already been established/tested and that only a particular DS1 or E1 port is being tested at this time.

In end-to-end testing, one shelf is referred to as the near end and the other shelf as the far end. These designations are arbitrary; either shelf can be the near-end or the far-end shelf.

Important! The LNW18 and LNW20 TMUX circuit packs do not support the DS1 port transmission tests.

Important! The Port Maintenance parameter for the affected ports must be provisioned *Allow* to perform this procedure. If the Port Maintenance parameter for the affected ports is provisioned *Inhibit*, loopback and test transmission commands for the affected ports are denied.

To view the Port Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Port Maintenance** to access the required port.

To provision the Port Maintenance parameter, a Privileged user must perform Procedure 7-23: “Allow/inhibit port/tributary maintenance” (p. 7-61).

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Required equipment

In addition to the equipment listed in “Required equipment” (p. 14-3), a DS1 or E1 Test Set is also required.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 14-3) in this chapter.
2. Refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.

3. Obtain the work instructions for this procedure and note the assigned AIDs.
4. Select **View** → **Equipment** to access the required DS1/E1 port and verify that the DS1/E1 port parameters have been provisioned correctly (according to the work instructions) at the terminating Alcatel-Lucent 1665 DMX shelf(s) of the circuit being tested.

   If required, select **Configuration** → **Equipment** to make DS1/E1 port provisioning changes.

   Refer to Procedure 4-9: "Provision DS1/E1 circuit packs/ports for service" (p. 4-50) for more information.

Steps

Complete the following steps to perform a DS1/E1 transmission test.

1 **Important!** Proper terminating and pass-through cross-connections must exist at each shelf (including stand-alone shelves) to establish continuity for the DS1/E1 circuit being tested.

Select **View** → **Cross-Connections** to obtain a cross-connection list and verify that the proper VT1.5/STS-n (DS1) cross-connections exist for the DS1 circuit to be tested. If an E1 circuit is to be tested, verify the proper STS-3 cross-connections exist.

If required, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and create the proper VT1.5/STS-n cross-connections for the DS1/E1 circuit to be tested.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*

2

If the transmission test is to be performed...	Then...
at a stand-alone shelf in the *Terminal* direction (toward the fiber),	At the required OLIUs, loop back the fiber. Refer to Procedure 14-6: "Connect OLIU optical loopbacks" (p. 14-58).
at a stand-alone shelf in the *Facility* direction (toward the DSX),	At the DSX-1 panel or equivalent connection point, connect a patch cord from the **OUT** jack to the **IN** jack associated with the DS1/E1 circuit being tested.

If the transmission test is to be performed...	Then...
in a Alcatel-Lucent 1665 DMX network (end-to-end),	At the far-end DSX-1 panel or equivalent connection point, connect a patch cord from the **OUT** jack to the **IN** jack associated with the DS1/E1 circuit being tested, *OR* log in to the far-end Alcatel-Lucent 1665 DMX shelf and select **Fault** → **Analysis** → **Loopback** to perform a *Terminal* loopback on the DS1/E1 circuit being tested.

Reference: The following figures show the test arrangements.

Figure 14-8 Stand-Alone shelf with OLIU loopback

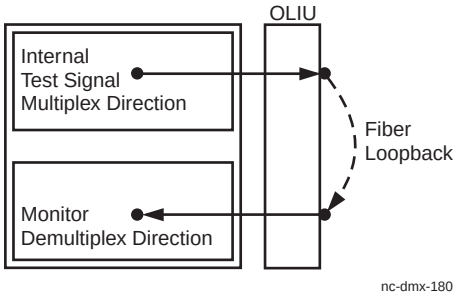


Figure 14-9 Stand-Alone shelf with DSX loopback

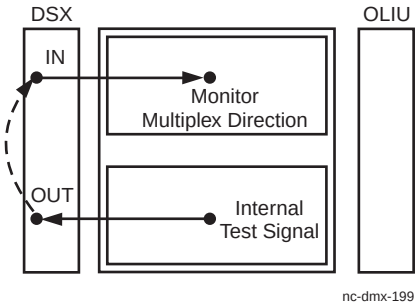
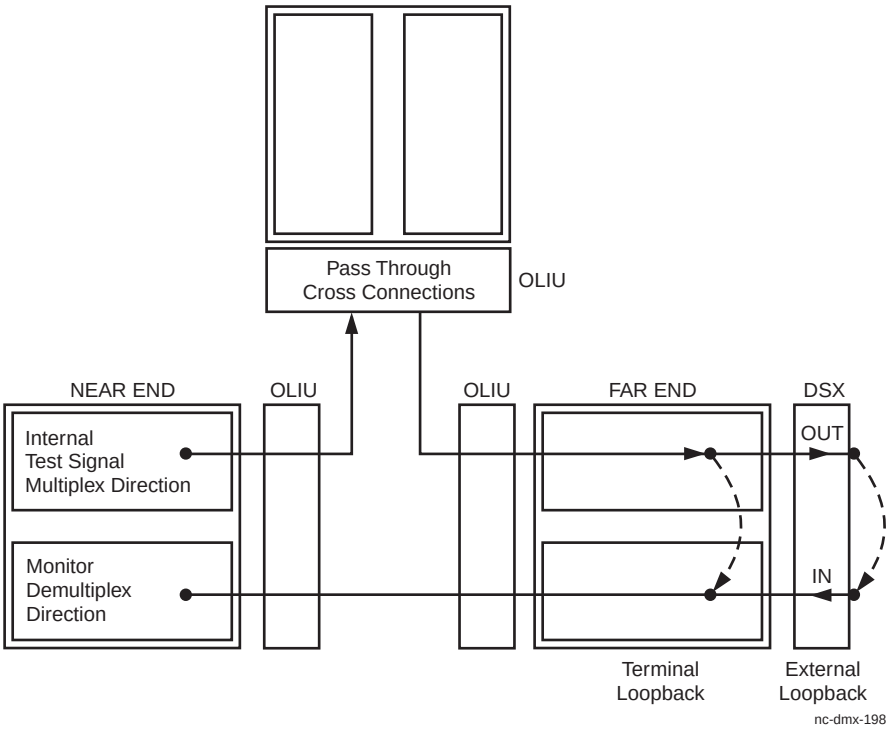


Figure 14-10 End-to-End DS1/E1 circuit with far-end loopback



3	If the transmission test is to be performed...	Then...
	at a stand-alone shelf in the *Terminal* direction (toward the fiber),	Either select **Fault** → **Test** → **Transmission** to perform a *terminal* transmission test on the DS1/E1 port, or connect a test set to the port to be tested at the DSX-1 panel or equivalent connection point and apply a DS1/E1 test signal.
	at a stand-alone shelf in the *Facility* direction (toward the DSX),	Select **Fault** → **Test** → **Transmission**to perform a *facility* transmission test on the DS1/E1 port.
	in a Alcatel-Lucent 1665 DMX network (end-to-end),	At the Near End, either select **Fault** → **Test** → **Transmission** to perform a *terminal* transmission test on the DS1/E1port, or connect a test set to the port to be tested at the DSX-1 panel or equivalent connection point and apply a DS1/E1 test signal.

4 Was the test successful (error free)?

If...	Then...
Yes,	Continue with Step 5.
No,	Proceed to Step 21.

5 Is the protection slot associated with the DS1/E1 circuit under test equipped with a companion circuit pack?

If...	Then...
Yes,	Continue with Step 6.
No,	Proceed to Step 9.

6 Select **Fault** → **Protection Switch** command to perform a manual switch from the current active circuit pack to the standby circuit pack. This may cause a hit and register some errors during the switch.

7 Was the circuit pack protection switch successful (recovered error free)?

If...	Then...
Yes,	Verify that the Standby circuit pack is now Active, and repeat Step 3 for the protection circuit pack. Then continue with Step 8.
No,	Proceed to Step 21.

8 Was the test successful (error free)?

If...	Then...
Yes,	Continue with Step 9.
No,	Proceed to Step 21.

9 Are you performing this test for a stand-alone Alcatel-Lucent 1665 DMX shelf or for end-to-end testing within a Alcatel-Lucent 1665 DMX network?

If...	Then...
Stand-alone test,	Continue with Step 10.
End-to-end test,	Proceed to Step 15.

10 Remove any patch cords/fibers used to loop back the circuit under test and disconnect the test set from the DSX-1 panel or equivalent connection point, if required.

11 Delete any cross-connections entered to perform this procedure.

Reference: Procedure 10-2: "Discontinue DS1 or E1 service" (p. 10-8)

12 In the System View screen, select **Configuration** → **Update System** → **Update All** to retire existing alarms caused by this procedure.

13 If required, repeat Step 1 through Step 12 for each DS1/E1 circuit to be tested.

14 STOP! End of Procedure.

15 At the near end, disconnect the test set from the DSX-1 panel or equivalent connection point, if required.

16 At the near end and far end, delete any cross-connections entered to perform this procedure.

Reference: Procedure 10-2: "Discontinue DS1 or E1 service" (p. 10-8)

17 At the far end, select **Fault** → **Analysis** → **Loopback** to release the *terminal* loopback, or remove the patch cords at the DSX-1 panel or equivalent connection point for the circuit under test.

18 At the near end and far end, select **Configuration** → **Update System** → **Update All** to retire existing alarms caused by this procedure.

19 If required, return to Step 1 and repeat this procedure for each DS1/E1 circuit to be tested.

20 STOP! End of Procedure.

21 Has the circuit pack that failed this test been replaced?

If...	Then...
Yes,	Proceed to Step 23.
No,	Continue with Step 22.

22 Replace the DS1/E1 circuit pack and repeat this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 Trouble may be in the DSX cross-connect wiring, T1 interface wiring, VT1.5/STS-1/STS-3 cross-connections in the network, or the shelf backplane. If you continue to experience problems, contact your next level of support.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 14-10: Perform DS3 transmission test

Overview

Use this procedure to test a DS3 port at a stand-alone Alcatel-Lucent 1665 DMX shelf or in a Alcatel-Lucent 1665 DMX network.

If this procedure is being used to perform end-to-end testing in a Alcatel-Lucent 1665 DMX network, it is assumed that the complete Alcatel-Lucent 1665 DMX network configuration (BLSR, UPSR, 1+1, Bidirectional 1+1, or Optimized 1+1) has already been established/tested and that only a particular DS3 port is being tested at this time.

In end-to-end testing, one shelf is referred to as the near end and the other shelf as the far end. These designations are arbitrary; either shelf can be the near-end or the far-end shelf.

Important! The LNW18 TMUX, LNW19 48DS3EC1, and LNW20 48TMUXDS3EC1 circuit packs do not support internal DS3 port transmission tests. If the near end is equipped with an LNW18, LNW19, or LNW20 circuit pack, use a DS3 test set to apply a DS3 test signal.

Important! The Port Maintenance parameter for the affected ports must be provisioned *Allow* to perform this procedure. If the Port Maintenance parameter for the affected ports is provisioned *Inhibit*, loopback and test transmission commands for the affected ports are denied.

To view the Port Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Port Maintenance** to access the required port.

To provision the Port Maintenance parameter, a Privileged user must perform Procedure 7-23: “Allow/inhibit port/tributary maintenance” (p. 7-61).

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Required equipment

In addition to the equipment listed in “Required equipment” (p. 14-3), a DS3 Test Set is also required.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 14-3) in this chapter.
2. Refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.

3. Obtain the work instructions for this procedure and note the assigned AIDs.
4. Select **View** → **Equipment** to access to the required DS3 port and verify that the DS3 port parameters have been provisioned correctly (according to the work instructions), at the terminating Alcatel-Lucent 1665 DMX shelf(s) of the circuit being tested.
   If required, select **Configuration** → **Equipment** to make DS3 port provisioning changes.
   Refer to Procedure 4-7: "Provision DS3/EC1 circuit packs/ports for service" (p. 4-44) for more information.

Steps

Complete the following steps to perform the DS3 transmission test.

1

Important! Proper terminating and pass-through cross-connections must exist at each shelf (including stand-alone shelves) to establish the continuity for the DS3 circuit being tested.

Select **View** → **Cross-Connections** to obtain a cross-connection list and verify that the proper STS-1 cross-connections exist for the DS3 circuit to be tested.

If required, select **Configuration** → **Cross-Connections** to access the *Cross-Connection Wizard* and create the proper STS-1 cross-connections for the DS3 circuit to be tested

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*

2

If the DS3 transmission test is to be performed...	Then...
at a stand-alone shelf in the *Terminal* direction (toward the fiber),	At the required OLIUs, loop back the fiber. Refer to Procedure 14-6: "Connect OLIU optical loopbacks" (p. 14-58).
in a Alcatel-Lucent 1665 DMX network (end-to-end)	At the far-end DSX-3 panel or equivalent connection point, connect a patch cord from the **OUT** jack to the **IN** jack associated with the DS3 circuit being tested, *OR* log in to the far-end Alcatel-Lucent 1665 DMX shelf and select **Fault** → **Analysis** → **Loopback** to perform a *Terminal* loopback on the DS3 circuit being tested. **Important!** The LNW19 48DS3EC1 circuit pack does not support terminal loopbacks.

Reference: The following figures show the test arrangements.

Figure 14-11 Stand-Alone shelf with OLIU loopback

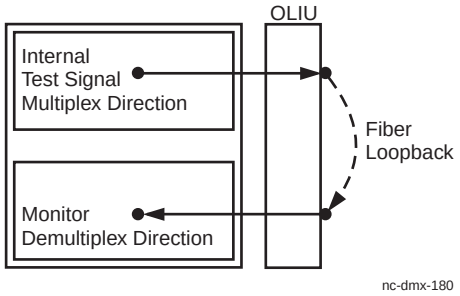
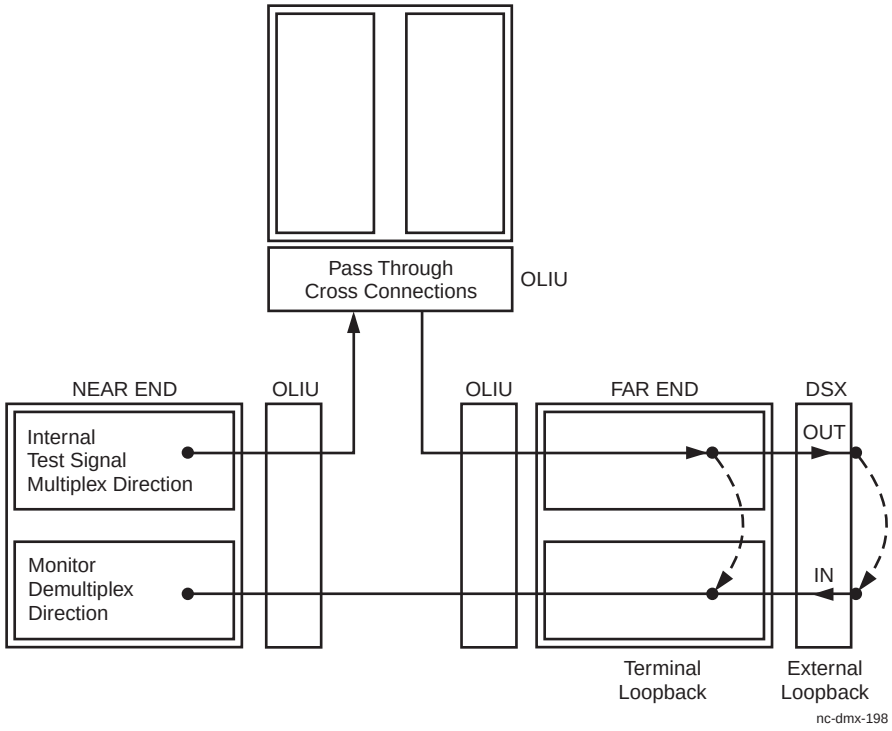


Figure 14-12 End-to-End DS3 circuit with far-end loopback



3 At the near end, select **Fault** → **Test** → **Transmission** to perform a *terminal* transmission test on the DS3 port, or connect a DS3 test set to the port to be tested at the DSX-3 panel or equivalent connection point and apply a DS3 test signal.

Important! The LNW18 TMUX, LNW19 48DS3EC1, and LNW20 48TMUXDS3EC1 circuit packs do not support internal DS3 port transmission tests. If the near end is equipped with an LNW18, LNW19, or LNW20 circuit pack, use a DS3 test set to apply a DS3 test signal.

4 Was the test successful (error free)?

If...	Then...
Yes,	Continue with Step 5.
No,	Proceed to Step 21.

5 Is the protection slot associated with the DS3 circuit under test equipped with a companion DS3 circuit pack?

If...	Then...
Yes,	Continue with Step 6.
No,	Proceed to Step 9.

6 Select **Fault** → **Protection Switch** to perform a manual switch from the current active circuit pack to the standby circuit pack. This may cause a hit and register some errors during the switch.

7 Was the circuit pack protection switch successful (recovered error free)?

If...	Then...
Yes,	Verify that the Standby circuit pack is now Active, and repeat Step 3 for the protection circuit pack. Then proceed to Step 8.
No,	Proceed to Step 21.

8 Was the test successful (error free)?

If...	Then...
Yes,	Continue with Step 9.
No,	Proceed to Step 21.

9 Are you performing this test for a stand-alone Alcatel-Lucent 1665 DMX shelf or for end-to-end testing within a Alcatel-Lucent 1665 DMX network?

If...	Then...
Stand-alone test,	Continue with Step 10.
End-to-end test,	Proceed to Step 15.

10 Remove the fibers used to loop back the circuit under test and disconnect the DS3 test set from the DSX-3 panel or equivalent connection point, if required.

11 Delete any cross-connections entered to perform this procedure.

Reference: Procedure 10-4: "Discontinue DS3 or EC-1 service" (p. 10-14)

12 In the System View screen, select **Configuration** → **Update System** → **Update All** to retire existing alarms caused by this procedure.

13 If required, repeat Step 1 through Step 12 for each DS3 circuit to be tested.

14 STOP! End of Procedure.

15 At the near end, disconnect the DS3 test set from the DSX-3 panel or equivalent connection point, if required.

16 At the near end and far end, delete any cross connections entered to perform this procedure.

Reference: Procedure 10-4: "Discontinue DS3 or EC-1 service" (p. 10-14)

17 At the far end, select **Fault** → **Analysis** → **Loopback** to release the *terminal* loopback, or remove the patch cords at the DSX-3 panel or equivalent connection point for the circuit under test.

18 At the near end and far end, select **Configuration** → **Update System** → **Update All** to retire existing alarms caused by this procedure.

19 If required, return to Step 1 and repeat this procedure for each DS3 circuit to be tested.

20 STOP! End of Procedure.

21 Has the DS3 circuit pack that failed this test been replaced?

If...	Then...
Yes,	Proceed to Step 23.
No,	Continue with Step 22.

22 Replace the DS3 circuit pack and repeat this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 Trouble may be in the DSX cross-connect wiring, T3 interface wiring, STS-1 cross-connections in the network, or the shelf backplane. If you continue to experience problems, contact your next level of support.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 14-11: Perform EC-1 transmission test

Overview

Use this procedure to test an EC-1 port at a stand-alone Alcatel-Lucent 1665 DMX shelf or in a Alcatel-Lucent 1665 DMX network.

If this procedure is being used to perform end-to-end testing in a Alcatel-Lucent 1665 DMX network, it is assumed that the complete Alcatel-Lucent 1665 DMX network configuration (BLSR, UPSR, 1+1, Bidirectional 1+1, or Optimized 1+1) has already been established/tested and that only a particular EC-1 port is being tested at this time.

In end-to-end testing, one shelf is referred to as the near end and the other shelf as the far end. These designations are arbitrary; either shelf can be the near-end or the far-end shelf.

Important! The Port Maintenance parameter for the affected ports must be provisioned *Allow* to perform this procedure. If the Port Maintenance parameter for the affected ports is provisioned *Inhibit*, loopback and test transmission commands for the affected ports are denied.

To view the Port Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Port Maintenance** to access the required port.

To provision the Port Maintenance parameter, a Privileged user must perform Procedure 7-23: “Allow/inhibit port/tributary maintenance” (p. 7-61).

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Required equipment

In addition to the equipment listed in “Required equipment” (p. 14-3), an EC-1 SONET Test Set is also required.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 14-3) in this chapter.
2. Refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.
3. Obtain the work instructions for this procedure and note the assigned AIDs.
4. Select **View** → **Equipment** to access the required EC-1 port and verify that the EC-1 port parameters have been provisioned correctly (according to the work instructions) at the terminating Alcatel-Lucent 1665 DMX shelf(s) of the circuit being tested.

If required, select **Configuration** → **Equipment** to make EC-1 port provisioning changes.

Refer to Procedure 4-7: "Provision DS3/EC1 circuit packs/ports for service" (p. 4-44) for more information.

Steps

Complete the following steps to perform the EC-1 transmission test.

1 **Important!** Proper terminating and pass-through cross-connections must exist at each shelf (including stand-alone shelves) to establish the continuity for the EC-1 circuit being tested.

Select **Configuration** → **Cross-Connections** to make/verify the proper STS-1 cross-connections for the EC-1 circuit to be tested, as required.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*

2

If the EC-1 transmission test is to be performed...	Then...
at a stand-alone shelf in the *Terminal* direction (toward the fiber),	At the required OLIUs, loop back the fiber. Refer to Procedure 14-6: "Connect OLIU optical loopbacks" (p. 14-58).
in a Alcatel-Lucent 1665 DMX network (end-to-end)	At the far-end STSX-1 panel or equivalent connection point, connect a patch cord from the **OUT** jack to the **IN** jack associated with the EC-1 circuit being tested, *OR* log in to the far-end Alcatel-Lucent 1665 DMX shelf and select **Fault** → **Analysis** → **Loopback** to perform a *Terminal* loopback on the EC-1 circuit being tested.

Reference: The following figures show the test arrangements.

Figure 14-13 Stand-Alone shelf with OLIU loopback

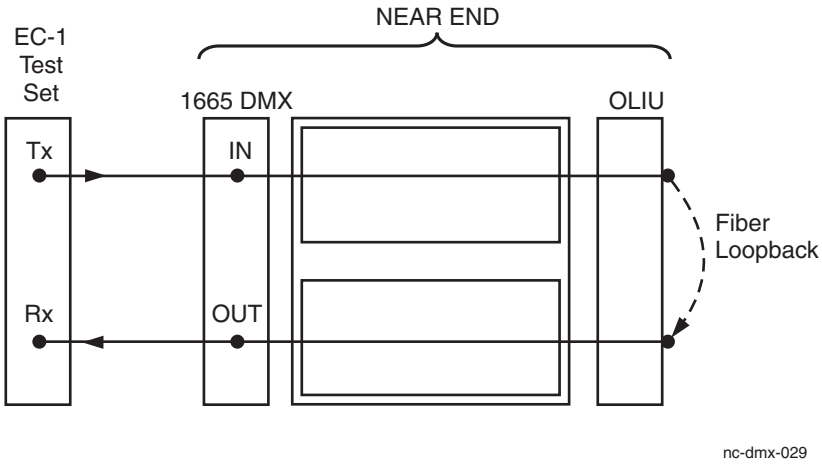
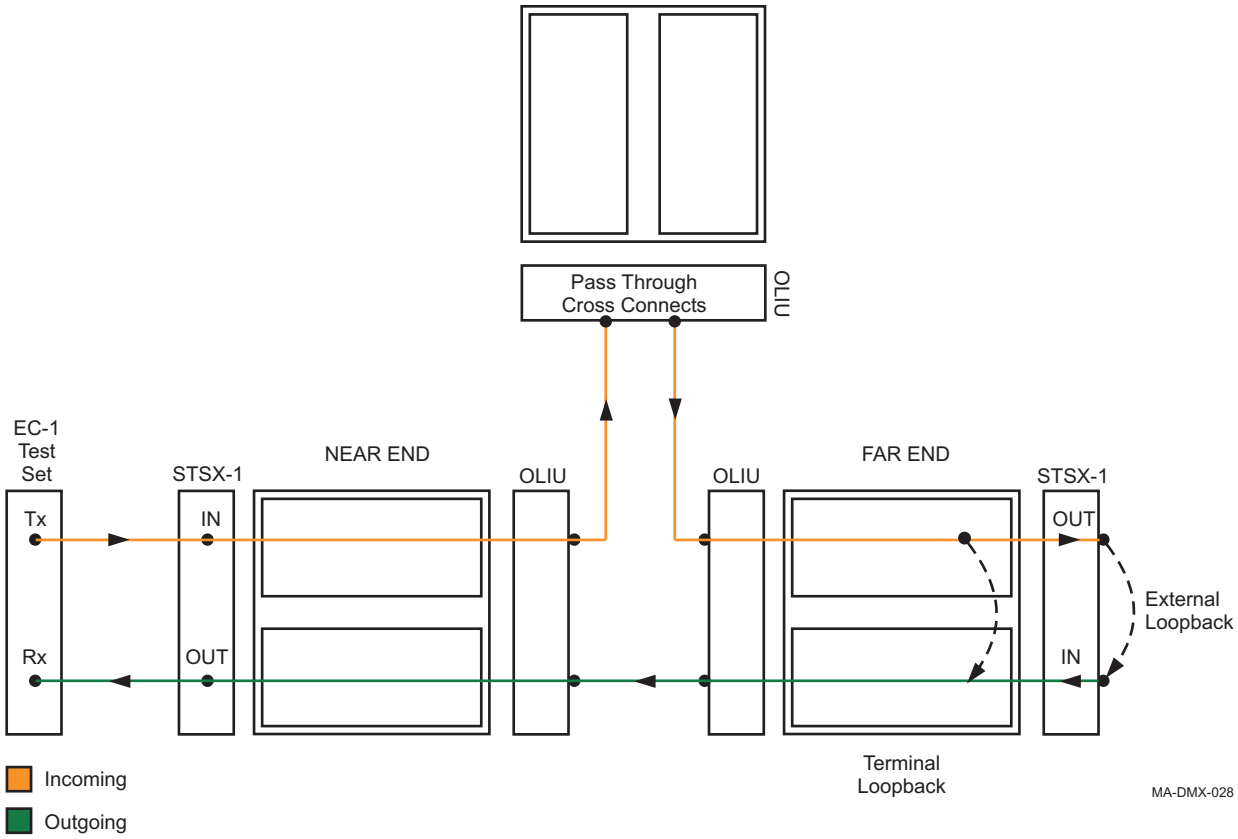


Figure 14-14 End-to-End EC-1 circuit with far-end loopback



3 At the near end, connect a SONET test set to the EC-1 port to be tested at the STSX-1 panel or equivalent connection point and apply an EC-1 test signal.

4 Was the test successful (error free)?

If...	Then...
Yes,	Continue with Step 5.
No,	Proceed to Step 21.

5 Is the protection slot associated with the EC-1 circuit under test equipped with a companion DS3/EC1 circuit pack?

If...	Then...
Yes,	Continue with Step 6.
No,	Proceed to Step 9.

6 Select **Fault** → **Protection Switch** to perform a manual switch from the current active circuit pack to the standby circuit pack. This may cause a hit and register some errors during the switch.

7 Was the circuit pack protection switch successful (recovered error free)?

If...	Then...
Yes,	Verify that the Standby circuit pack is now Active, and repeat Step 3 for the protection circuit pack. Proceed to Step 8.
No,	Proceed to Step 21.

8 Was the test successful (error free)?

If...	Then...
Yes,	Continue with Step 9.
No,	Proceed to Step 21.

9 Are you performing this test for a stand-alone Alcatel-Lucent 1665 DMX shelf or for end-to-end testing within a Alcatel-Lucent 1665 DMX network?

If...	Then...
Stand-alone test,	Continue with Step 10.
End-to-end test,	Proceed to Step 15.

10 Remove the fibers used to loop back the circuit under test and disconnect the SONET test set from the STSX-1 panel or equivalent connection point.

Important! Unterminated EC-1 circuits require a 75 ohm termination or loopback at the STSX-1 to prevent incoming alarm indications.

11 Delete the cross-connections entered to perform this procedure.

Reference: Procedure 10-4: “Discontinue DS3 or EC-1 service” (p. 10-14)

12 In the System View screen, select **Configuration** → **Update System** → **Update All** to retire existing alarms caused by this procedure.

13 If required, repeat Step 1 through Step 12 for each EC-1 circuit to be tested.

14 STOP! End of Procedure.

15 At the near end, disconnect the SONET test set from the STSX-1 panel or equivalent connection point.

16 At the near end and far end, delete any cross connections entered to perform this procedure.

Reference: Procedure 10-4: "Discontinue DS3 or EC-1 service" (p. 10-14)

17 At the far end, select **Fault** → **Analysis** → **Loopback** to release the *terminal* loopback, or remove the patch cords at the STSX-1 panel or equivalent connection point the circuit under test.

18 At the near end and far end, select **Configuration** → **Update System** → **Update All** to retire existing alarms caused by this procedure.

19 If required, return to Step 1 and repeat this procedure for each EC-1 circuit to be tested.

20 STOP! End of Procedure.

21 Has the DS3/EC1 circuit pack that failed this test been replaced?

If...	Then...
Yes,	Proceed to Step 23.
No,	Continue with Step 22.

22 Replace the DS3/EC1 circuit pack and repeat this procedure.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

23 Trouble may be in the STSX-1 cross-connect wiring, EC-1 interface wiring, STS-1 cross-connections in the network, or the shelf backplane. If you continue to experience problems, contact your next level of support.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302*

END OF STEPS

Procedure 14-12: Test function unit equipment protection switching

Overview

Use this procedure to test Alcatel-Lucent 1665 DMX Function unit 1+1 equipment protection switching for the low-speed electrical circuit packs.

Important! Alcatel-Lucent 1665 DMX does not support 1+1 equipment protection switching for low-speed OLIUs and Ethernet circuit packs.

Privilege level

You must log in as either a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure and verify that the protection group AID is specified.
4. Verify that the Function unit to be tested contains a pair of identical circuit packs.

Steps

Complete the following steps to test 1+1 equipment protection switching in a Function unit.

1 From the System View menu, select **View** → **Protection**.

Result: The *View Protection* window opens.

2 Select the required 1+1 Equipment Protection Group according to the work instructions and click **Select**.

Result: The Protection Group parameters appear.

3 Note the *Active Unit* (circuit pack) and click **Close**.

4 From the System View menu, select **Fault** → **Protection Switch**.

Result: The *Switch Protection* window opens.

5 Select the required 1+1 Equipment Protection Group according to the work instructions and click **Select**.

Result: The protection switch parameters appear.

6 **Important!** If the protection slot is unequipped, has the wrong circuit pack type, or the circuit pack is failed, the protection switch request is denied.

In the **Protection Switch Mode** panel, select **Manual (Normal)** as the **Switch Type** from the pull-down menu. Then click **Apply**.

Result: A warning appears asking you to confirm executing this command. Click **Yes** and **Close**.

7 Repeat Step 1 through Step 3 to verify that the protection switch was performed and the active/standby states have reversed for the circuit packs in the Protection Group.

END OF STEPS

Procedure 14-13: Perform LED test

Overview

Use this procedure to test circuit pack LEDs.

Important! The LED test does not affect the LEDs on the fan unit.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Ensure that Alcatel-Lucent 1665 DMX is equipped with required circuit packs at the node being tested.

Steps

Complete the following steps to perform the LED test.

1 **Important!** All LEDs on the shelf may be tested using **Fault** → **Test** → **LED** or the **ACO TEST** push-button on the SYSCTL circuit pack. The **Fault** → **Test** → **LED** command may also be used to test LEDs on an individual circuit pack. The LED test does not affect the LEDs on the fan unit.

If using the...	Then...
ACO TEST push-button on the SYSCTL circuit pack,	Continue with Step 2.
Fault → **Test** → **LED** command,	Proceed to Step 4.

2 Press and hold the **ACO TEST** push-button *momentarily* on the SYSCTL circuit pack. Verify that all circuit pack LEDs light, and release the **ACO TEST** push-button. The LEDs revert to their previous state.

If the **ACO TEST** push-button is pressed for two or more seconds and released, the **IND** display on the SYSCTL circuit pack faceplate shows the generic software version.

3 Did the LED test pass?

If...	Then...
Yes	STOP! End of Procedure.
No	Contact your next level of support.

4 From the System View menu, select **Fault** → **Test** → **LED**.

5 Highlight **Shelf** (tests all shelf LEDs) or **CP xxx** (tests individual circuit pack LEDs) and click **Select**.

Result: The *Test LED* window opens.

6 In the **Number of Iterations** field, enter a number from 1 to 10 from the pull-down menu to indicate the number of cycles during which the LED test should be repeated and click **OK**.

Important! On-site personnel must be physically in front of NE to witness the LED test cycles.

Result: For each iteration:

1. All LEDs for the specified address light.
2. After 10 seconds, all LEDs go off.
3. After another 10 seconds, all LEDs are updated to show the current status of the system.

7 Did the LED test pass?

If...	Then...
Yes,	STOP! End of Procedure.
No,	Contact your next level of support.

END OF STEPS

Procedure 14-14: Retrieve software generic release and database information

Overview

Use this procedure to retrieve information about the active, previous, and dormant software generics and the active, previous, and backup databases present on the NVMs installed in the LNW2 SYSCTL.

Privilege level

Any user (Privileged, General, Maintenance, or Reports Only) can complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

Steps

Complete the following steps to retrieve information about the active, previous, and dormant software generics and the active, previous, and backup databases present on the NVMs installed in the LNW2 SYSCTL.

1 Are you physically in front of the Alcatel-Lucent 1665 DMX for which you want to determine ONLY the generic software version (not database information)?

If...	Then...
Yes,	Continue with Step 2.
No,	Proceed to Step 5.

2 Depress and hold the **ACO TEST** push-button on the LNW2 SYSCTL for about 4 seconds.

Result: All LEDs on the shelf light. A red, 35-segment (5 x 7) rectangle appears in the **IND** display on the SYSCTL. Since the **IND** display is a 35-segment display, this test indicates all segments are working.

3 Release the **ACO TEST** push-button on the LNW2 SYSCTL when the red rectangle disappears in the **IND** display.

Result: The current software generic appears in the **IND** display on the LNW2 SYSCTL and the shelf LEDs return to their previous status.

4 STOP! End of Procedure.

5 Connect the PC and establish a *WaveStar*® CIT session.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

6 The active generic is displayed in title bar in the *WaveStar*® CIT System View window.

OR

From the System View, select **View** → **Software Generic**.

Result: The *View Software Generic* screen appears. This screen displays information about the Software Generic(s) and Database(s).

Software generic Displays the software generics available on the NVMs:

- Active: The software generic running from the NVMs is composed of boot code, compressed SYSCTL code, uncompressed SYSCTL code, and compressed SMART CP code.
- Previous: When a new generic is applied, the Active generic is renamed Previous and retains the same structure. If there is no Previous generic, "?" is displayed.
- Dormant:
  - A software generic was downloaded to the NE but not yet applied.
  - A release for a compatible Product Type was downloaded to the NE. A Alcatel-Lucent 1665 DMX 5.x generic or earlier is treated as a different product type because it cannot be applied on the LNW2.

  When a valid Dormant generic is applied, the Active becomes the Previous and the Dormant becomes the Active. Since after the Dormant is applied, there is no longer a Dormant generic, "?" is displayed.

Product Type Displays the associated product type for each generic.

- For the Active and Previous generics the only valid Product type is DMX.
- For the Dormant software generic, the Product Type can be any of the following product types
  - dmx = Alcatel-Lucent 1665 DMX
  - dmxtend = Alcatel-Lucent 1665 DMXtend
  - dmxpress = *Metropolis*® DMX*press*
  - dmxplore = Alcatel-Lucent 1850 TSS-5
  - ddmoc3 = DDM OC-3
  - ddmoc12 = DDM-2000 OC-12
  - fbrrch = FIBER REACH

Databases Displays available databases on the NVMs:

- Active - When a new generic is installed, the Active database is saved and renamed Previous, the Active database is updated, and the security and history files are changed to record the APPLY command and any resulting messages.

  The Active database release must match the Active generic release.
- Previous - When a new generic is installed, the Active database is renamed Previous. If there is no Previous database, "?" is displayed.
- Backup - A backup database was downloaded to the NE but not selected to be the Active database.

  When a valid Backup database is selected, the Active becomes the Previous and the Backup becomes the Active. Since after the Backup is selected, there is no longer a Backup database, "?" is displayed.

END OF STEPS

Procedure 14-15: Check -48 V DC office battery

Overview



WARNING

Electric-shock hazard

-48 volt DC is present in the input power cables at the rear of the Alcatel-Lucent 1665 DMX shelf.

Follow local practices to avoid electric shock.



NOTICE

Service-disruption hazard

If system is in service, service interruption will occur if both power cables are disconnected.

Disconnected the power cables one at a time to avoid a service interruption.

Use this procedure to check the office battery voltage.

Required equipment

In addition to the equipment listed in "Required equipment" (p. 14-3), a multimeter capable of measuring voltage in the 40 to 60 volt range is also required.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Verify that a multimeter is available.
4. Obtain the work instructions for this procedure.

Steps

Complete the following steps to perform the office battery test.

1 Obtain multimeter for measuring the DC voltage.

2 Remove ONE of the input power cables at the rear of the Alcatel-Lucent 1665 DMX shelf.

3 Use multimeter to measure DC voltage in the power cable connector. Place negative probe in power cable connector and positive probe to a solid chassis ground.

Result: Voltage measurement is between -40.0 and -60.0 volts DC.

4 Was the requirement met?

If...	Then...
Yes,	Proceed to Step 7.
No,	Continue with Step 5.

5 Trouble in power feeder(s) or office battery distribution. Refer trouble to organization that installed the shelf.

6 STOP! End of Procedure.

7 Have both power cables been checked?

If...	Then...
Yes,	Proceed to Step 9.
No,	Continue with Step 8.

8 Reinstall power cable if removed. Remove other power cable and repeat this procedure from Step 3 for other power cable.

9 Are both power cables installed?

If...	Then...
Yes,	Proceed to Step 11.
No,	Continue with Step 10.

10 Install BOTH power cables at rear of Alcatel-Lucent 1665 DMX shelf.

11 Is any circuit breaker tripped?

If...	Then...
Yes,	Continue with Step 12.
No,	Proceed to Step 16.

12 Reset circuit breaker.

13 Did circuit breaker trip again?

If...	Then...
Yes,	Continue with Step 14.
No,	Proceed to Step 16.

14 Trouble in backplane connector. Refer trouble to the organization that installed the shelf.

15 STOP! End of Procedure.

16 Are PWR A and B LEDs lighted?

If...	Then...
Yes,	STOP! End of Procedure.
No,	Continue with Step 17.

17 Trouble in backplane connector. Refer trouble to the organization that installed the shelf.

END OF STEPS

Procedure 14-16: Operate/release facility or terminal loopbacks

Overview



NOTICE

Service-disruption hazard

Executing this command may affect service. This command creates a terminal or facility loopback at the specified interface.

This command should only be used during pre-service testing of facilities and during fault diagnostics. The loopback request remains active until released; for example, by command, or until overridden by an NE initialization or repowering.

This procedure may be used to operate or release *Facility* or *Terminal* loopbacks.

Important! The Port Maintenance parameter for the affected ports must be provisioned *Allow* to perform this procedure. If the Port Maintenance parameter for the affected ports is provisioned *Inhibit*, loopback commands for the affected ports are denied.

To view the Port Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Port Maintenance** to access the required port.

To provision the Port Maintenance parameter, a Privileged user must perform Procedure 7-23: “Allow/inhibit port/tributary maintenance” (p. 7-61).

Privilege level

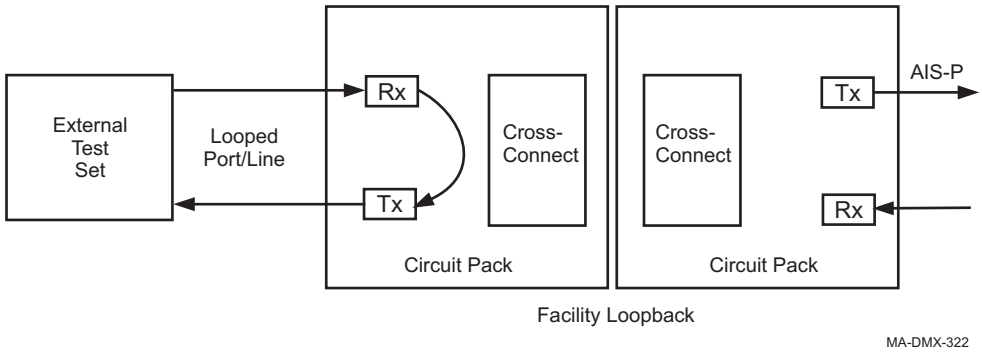
You must log in as either a Privileged or General user to complete this procedure.

Facility loopbacks

A *Facility* loopback connects the incoming received signal to the transmitter in the return direction. Electrical signals are looped back intact, including BPVs. Optical signals are looped back after the optical to electrical conversion.

Figure 14-15, “Facility loopback example” (p. 14-99) shows a facility loopback used in a test arrangement with an external test set.

Figure 14-15 Facility loopback example



Reference the following for additional information on facility loopbacks:

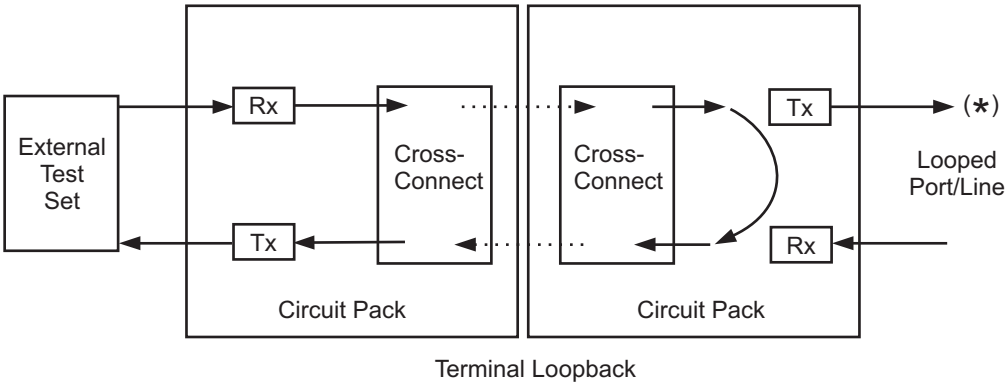
- Establishing a facility loopback may cause switching in UPSR or 1+1 applications. Anything not force switched to the looped-back side will switch, unless the other side is failed.
- Optical facility loopbacks operate on an OC-n line AID.
- Two Command Mode parameters (**NORM** [normal] or **FRCD** [forced]) are available for the **Fault** → **Analysis** → **Loopback** → **Facility** command. If the Command Mode is NORM, the loopback is denied unless the port is NMON. If the Command Mode is FRCD, the loopback is accepted (as long as the other parameters are valid).
- If the Command Mode is **NORM** and the line is *not* in the NMON state, the command is denied.
- If the Command Mode is **FRCD** an AIS-L alarm is generated (if the line is *not* in the NMON state) and path or line switching requests are generated in UPSR and 1+1 applications.

Terminal loopbacks

A *Terminal* loopback is used to loop back the entire transmitted signal into the associated incoming receiver.

Figure 14-16, “Terminal loopback example” (p. 14-100) shows a terminal loopback used in a test arrangement with an external test set.

Figure 14-16 Terminal loopback example



(*) = See table below for signal transmitted.

If interface type is...	Then signal transmitted is...
DS1	AIS
DS3 (LNW19B and LNW20)	AIS
DS3 (LNW16)	Bridged
SONET	Bridged
Ethernet	Open
Data	Open

MA-DMX-323

Reference the following for additional information on terminal loopbacks:

- Establishing a terminal loopback may cause switching in UPSR or 1+1 applications. If all traffic is switched away from the side to be looped back, establishing the loopback is not initially service-affecting.
- A line or path must be switched to the side with the loopback in order to see the effect of the loopback. In UPSR applications, it's possible to isolate individual paths for testing by switching all traffic away from the looped-back line, then switching the path to be tested to the looped-back line.
- Optical terminal loopbacks operate on an OC-n line AID.
- The only valid value for the Command Mode in the **Fault** → **Analysis** → **Loopback** command is **FRCD** for OCn Terminal loopbacks

Loopback availability

The system supports Facility loopbacks for:

- DS1, E1, DS3, and EC-1
  The LNW20 48TMUXDS3EC1 circuit pack supports DS1 loopbacks when the associated DS3 port is provisioned for *Ported Chan* applications only.

The LNW20 48TMUXDS3EC1 circuit pack supports DS3 loopbacks when the associated DS3 port is provisioned for *Ported* applications only.

- OC-3, OC-12, OC-48, OC-192 ports
- Ethernet LAN ports on LNW78 and LNW70/LNW170 Gigabit and Link Aggregation Groups (LAGs).

  Important! The Ethernet LAN ports that are members of a Link Aggregation Group may have simultaneous facility loopbacks. The facility loopbacks are addressed to the individual Ethernet LAN ports, not the Link Aggregation Group. If any LAN ports have facility loopbacks within the Link Aggregation Group, then the Link Aggregation Group alarms are suppressed.

The system supports Terminal loopbacks for:

- DS1, E1, DS3, and EC-1
  The LNW20 48TMUXDS3EC1 circuit pack supports DS1 loopbacks when the associated DS3 port is provisioned for *Ported Chan* applications only.
  The LNW20 48TMUXDS3EC1 circuit pack supports DS3 loopbacks when the associated DS3 port is provisioned for *Ported* applications only.
- OC-3, OC-12, OC-48, OC-192 ports
- Data ports on the LNW73 and LNW73C circuit packs
- All Ethernet LAN ports

  Important! If an Ethernet LAN port is part of a Link Aggregation Group, then terminal loopbacks are only allowed to the Link Aggregation Group, not individual Ethernet LAN ports. The Link Aggregation Group alarms are also suppressed.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Refer to "Facility loopbacks" (p. 14-98) and "Terminal loopbacks" (p. 14-99) for related information.
4. Obtain the work instructions for this procedure and verify that the port AID is specified.
5. Verify that the port to be looped back is not part of a test access session. A loopback request is denied if the port is part of a test access connection.
6. Determine whether or not loopbacks are managed as standing conditions for the entire system
   From the System View menu, select **Configuration** → **Equipment** from the System View main menu.

When the dialog box appears, type **system** inside the **Enter AID** field (if not present), and click **Select**. Navigate to *System Data* and *Loopback Condition Reporting* and select the desired setting.

- **ENABLE** (default): Standing conditions are reported for loopbacks. The **ABN** LED is lit if there is one or more existing loopbacks in the system.
- **DISABLE**: Standing conditions are not reported for loopbacks. The **ABN** LED is unaffected by loopback operation.

7. Determine if loopbacks on PDH, EC1 and Ethernet ports are handled based on the state of those ports.

   From the System View menu, select **Configuration** → **Equipment** from the System View main menu.

   When the dialog box appears, type **system** inside the **Enter AID** field (if not present), and click **Select**. Navigate to *System Data* and *State Check Before Loopback* and select the desired setting.

   - **DISABLE** (default): The execution of loopbacks for PDH, EC1 and Ethernet ports ignores the value of **Command Mode** (NORM or FRCD) in Step 3
   - **ENABLE**: The execution of loopbacks for PDH, EC1 and Ethernet ports is a function of the respective port's primary state and the value of **Command Mode** (NORM or FRCD) in Step 3.

Steps

Use this procedure to operate or release a loopback.

1 From the System View menu, select **Fault** → **Analysis** → **Loopback**.

Result: The *Loopback* window opens.

2 Find and expand the details for the required circuit pack. Select (highlight) the port to be looped back, then click **Select** at the bottom of the window.

Result: The loopback parameters appear.

3 Select **Operate** or **Release**, the **Loopback Type** (Terminal or Facility), and the **Command Mode** (NORM or FRCD), if available.

4 At the bottom of the window, click **Apply** to perform the selected operation.

Result: A warning appears asking you to confirm executing this command. Click **Yes** and **Close**.

END OF STEPS

Procedure 14-17: Observe FTP progress

Overview

Use this procedure to observe the progress of a transfer via FTP.

Important! This procedure assumes that the *WaveStar*® CIT is your FTP Server and can only be performed if you selected **Enable WaveStar CIT FTP Server** during the *WaveStar*® CIT installation, refer to Procedure 14-1: "Install software on the PC" (p. 14-4). If you selected **Disable WaveStar CIT FTP Server**, you cannot use this procedure.

Required equipment

Only a personal Computer (PC) with *WaveStar*® CIT software (with **Enable WaveStar CIT FTP Server** selected) installed is required to perform this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 14-3) in this chapter.

Steps

Complete the observe FTP progress.

1 From the Network View, either

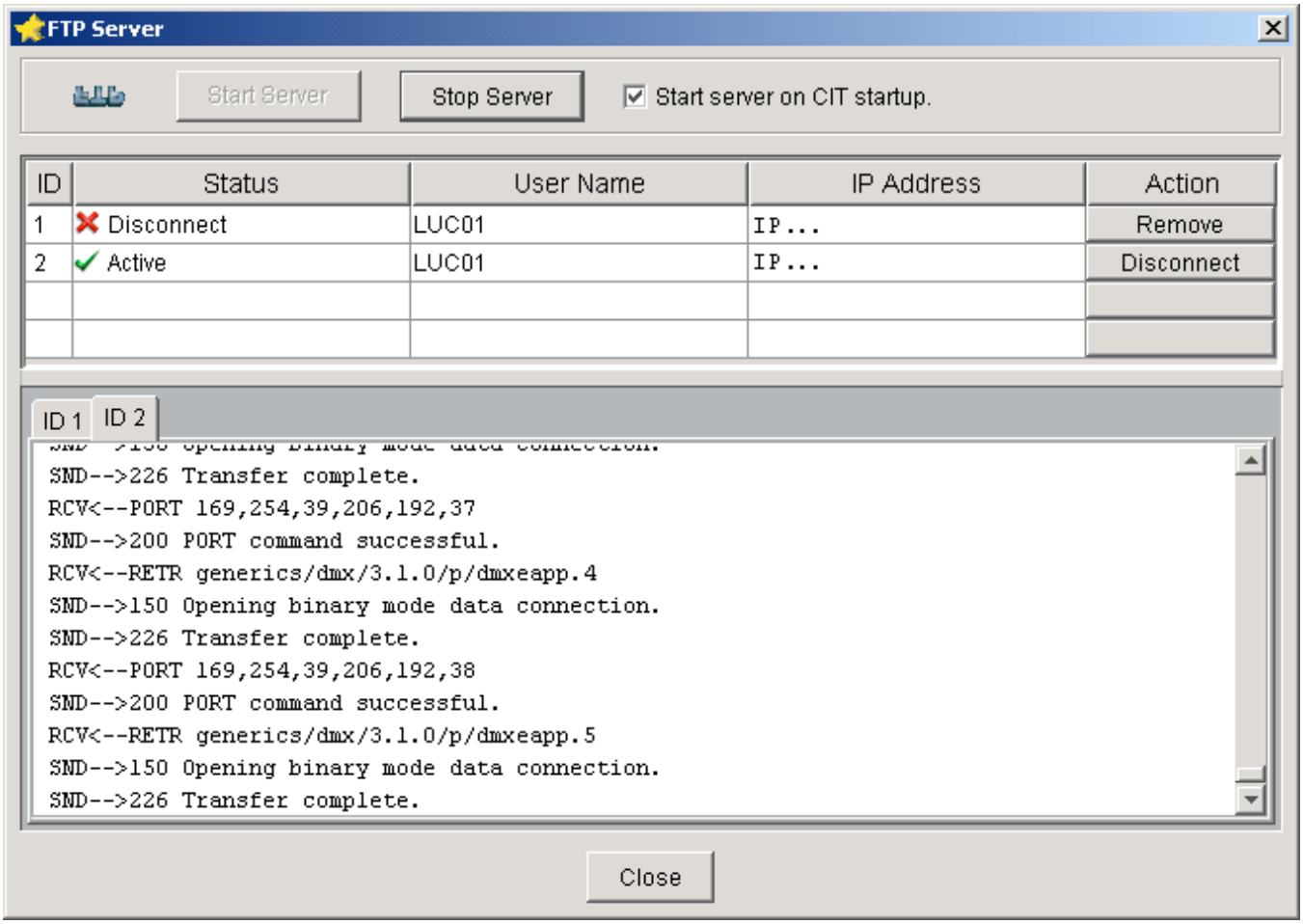
- select **Administration** → **FTP Administration**.

  or

- click on the rotating FTP icon in the lower left-hand corner of the Network View Window.

  Important! This step is executed from the Network View; most *WaveStar*® CIT activities are executed from the System View.

Result: The following FTP Server window opens.



The FTP server may display multiple FTP sessions listed by ID 1, 2.... The active session is identified by a green check-mark and the Status: Active. Older sessions are identified by a red X and the Status: Disconnect.

2 Identify the ID for the Active session and click on the corresponding IDx tab to view the transmission progress. When the transmission is complete, the Status for that ID changes to Disconnect. Click **Close** when finished.

Important! If the FTP server fails to start, it could mean that another program using an FTP server is already running. Depending on what operating system you are using, you must go to the device file and disable the FTP server. Refer to Procedure 14-18: "Disable an FTP server on your PC" (p. 14-105) for instructions for each allowed operating system.

END OF STEPS

Procedure 14-18: Disable an FTP server on your PC

Overview

Use this procedure to disable an FTP server application that is running on the personal computer being used for the *WaveStar*® CIT.

Required equipment

Only a personal Computer (PC) with *WaveStar*® CIT software installed is required to perform this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) in this chapter
2. Because multiple FTP applications might be installed on this PC, you must be able to identify the program you wish to disable.

Steps

Complete the following steps to disable an FTP server application.

1 Which Windows Operating System are you using?

If...	Then
Windows 2000	Continue with Step 2.
Windows XP	Proceed to Step 7.
Windows 7	Proceed to Step 11.

2 For Windows 2000 operating systems, select **Start** → **Settings** → **Control Panel**.

3 Select **Administrative Tools**, then **Computer Management**, then **Services and Applications**, and then **Services**.

4 Locate the FTP file that is running and double click the FTP icon.

5 In the **Service Status:** field, click **Stop**.

6 STOP! End of Procedure.

7 For Windows XP operating systems, select **Start** → **Control Panel**.

8 Click the **Performance and Maintenance** icon, then the **Administrative Tools** icon, and then **Services**.

9 Locate the FTP service that is running and select it.

10 Click **Stop**, then **Close**.

11 For Windows 7 operating systems, select **Start** → **Control Panel**.

12 Click the **Administrative Tools** icon and then **Services**.

13 Locate the FTP service that is running and select it.

14 Click **Stop**, then **Close**.

END OF STEPS

Procedure 14-19: Reset the system

Overview

Use this procedure to perform a system reset. This procedure details resetting the system software by reinitializing/resetting the SYSCTL via the *WaveStar*® CIT (preferred method) or reseating the SYSCTL (communication via the *WaveStar*® CIT failed).

Important! If a system (software) reset is required, the recommended method is via the *WaveStar*® CIT (Step 2).

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to reset the system.

1 Do you have *WaveStar*® CIT connectivity to the NE that you wish reset?

If...	Then...
Yes,	Continue with Step 2.
No,	Proceed to Step 8.

2 From the System View menu, select **Fault** → **Reset** → **System Controller**.

Result: The *Reset System Controller* window opens.

3 Select the appropriate option.

- **Reset the system software without changing parameters (Phase 3)** (**`init-sys:3`**) Existing cross-connections, TID, and current database information are retained.

Phase 3 is available to Privileged and General users.

- **Restore the system-level parameters to their default values (Phase 9)** (**`init-sys:9`**) The system controller defaults are restored. For example, only default logins exist and TCP/IP addresses return to their default state (none).

  Phase 9 is only available to Privileged users.

  The TID provisioning, transmission circuit pack provisioning, and cross-connection maps are retained.

4 Click **OK**.

Result: A warning appears asking you to confirm executing this command.

5 Click **Yes** to execute the command.

Important! You will be logged off the system when the system resets.

Result: You are logged off the system.

A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

6 Log back in the NE that was reset.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

7 STOP! End of Procedure.

8 If the pack is operational (not failed), initiate a ten-second countdown (9, 8, 7, 6, 5, 4, 3, 2, 1, 0) in the **IND** display on the SYSCTL by simultaneously depressing the **ACO TEST** and **SEL** buttons on the front of the SYSCTL.

Important! Removing the SYSCTL without initiating the ten-second countdown may result in unexpected and undesirable protection switches, incorrect circuit fault indications, or incoming signal failure alarms. All SYSCTL functions are suspended during the countdown.

9 Unseat the SYSCTL circuit pack during the 10-second countdown.

10 Re-seat the SYSCTL circuit pack and allow a few minutes for the pack to complete initialization.

Result: A flashing **b** in the **IND** display on the SYSCTL indicates that a boot is in progress. During the boot, the **b** may extinguish for up to 20 seconds and then resume flashing.

11 Connect PC and establish a *WaveStar*® CIT session to the reset NE.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

END OF STEPS

Procedure 14-20: Reset smart circuit pack

Overview

Use this procedure to reset a smart circuit pack.

Smart circuit packs

Smart circuit packs have microprocessors and run software.

Alcatel-Lucent 1665 DMX supports the following smart circuit packs:

- LNW6 28DS1
- LNW7 28DS1PM
- LNW8 56DS1/E1
- LNW801 56DS1/E1
- LNW16 12DS3EC1
- LNW18 12TMUX
- LNW19/LNW19B 48DS3/EC1
- LNW20 48TMUXDS3EC1
- LNW55 OC3/OC12/OC48
- LNW59 OC-192
- LNW62 4OC-48
- LNW63 GBE PL
- LNW64 GBE PL
- LNW66 10/100T
- LNW67 1GSX
- LNW68 1GLX
- LNW70 100/1G FS
- LNW71 10/100-PL
- LNW73/LNW73C FC
- LNW74 10/100 T/F
- LNW78 100/1G FSR
- LNW82 OC3/OC12/OC48
- LNW87 FE/GBE PL
- LNW170 100/1G FXS
- LNW504 OC-48/OC-192
- LNW603 OC-192

- LNW705 XM10G/8
- LNW785 OMD5/8

Hard resets

Hard resets (default) are available for all smart circuit packs. Hard resets initialize the board controller and restart all devices on the affected smart circuit pack, similar to a *power on* scenario.

When a hard reset occurs on Ethernet, DATA, OMD, XM10G/8, smart OLIUs, and on unprotected DS1, DS3 and TMUX circuit packs, service will be affected. Hard resets should be used only when service is already disrupted in the affected circuit pack.

Soft resets

Soft resets are available for all smart circuit packs. Soft resets restart the circuit pack application software for the affected smart circuit pack.

Privilege level

You must log in as a Privileged or General user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Obtain the work instructions for this procedure and/or determine the smart circuit pack to be reset.

Steps

Complete the following steps to reset a smart circuit pack.

1

If performing a...	Then...
hard reset on an LNW59, LNW82, or LNW504 OLIU circuit pack,	Continue with Step 2.
hard reset on an protected circuit pack,	Proceed to Step 3.
soft reset,	Proceed to Step 4.
hard reset on an unprotected circuit pack,	

2 **Important!** If the smart OLIU circuit pack to be reset is part of a protected pair of circuit packs and is the active circuit pack for timing, then a manual timing switch must be performed before resetting the smart OLIU circuit pack.

Select **View** → **Timing/Sync** to view the Timing/Sync parameters. Observe the value of the *Active Circuit Pack* parameter to determine the active circuit pack for timing. Click **Close**.

If required, select **Fault** → **Timing/Sync Protection Switch**→ **Main Circuit Pack Timing Switch** to perform a *Manual* switch.

3 **Important!** If the smart circuit pack to be reset is part of a protected pair of circuit packs and is the active circuit pack for transmission, then a manual switch must be performed before resetting the smart circuit pack.

To obtain a current list of circuit packs select **Reports** → **Status Lists** → **Pack**, then click *Shelf* and **Select**. Determine if the smart circuit pack to be reset is part of a protected pair of circuit packs. Observe the value of the *Switch State* parameter for the smart circuit pack to be reset. If the *Switch State* parameter is *active*, the circuit pack is the active circuit pack for transmission. Click **Close**.

If required, select **Fault** → **Protection Switch** to access the required protection group and perform a *Normal* Switch Type.

4 

NOTICE

Service-disruption hazard

If the smart circuit pack to be reset is not part of a protected pair of circuit packs, the reset may cause loss of service.

If the smart circuit pack to be reset is part of a protected pair of circuit packs and the companion circuit pack is failed, the reset may cause loss of service.

Select **Fault** → **Reset** → **Smart Pack**. Click on the smart circuit pack to be reset and **Select**.

5 Select the *Hard* or *Soft* **Reset Type** (if required) and click **Apply**.

Result: A warning may appear asking you to confirm executing this command. Click **Yes** to reset the smart circuit pack. A dialog box appears indicating a successful reset. Click **OK**.

END OF STEPS

Procedure 14-21: Change the network card selection

Overview

Use this procedure to change the network card selection.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to change the network card selection.

1 From the Network View menu, select **Administration** → **OSI/Network Card Assignment**.

2 Select the desired card number in the Network Card drop-down list.

3 Confirm the Network Card properties are correct in the text box display area.

4 Click **OK** to confirm your selection or **Cancel** to exit the dialog box without making any changes.

END OF STEPS

Procedure 14-22: Replace defective fan unit

Overview

Use this procedure to replace a fan unit.

Required equipment

The following equipment is required:

- Wrist strap
- Small phillips-head screwdriver
- Small flat-blade screwdriver

Before you begin

Ensure that the replacement fan unit is the same type as the original fan unit.

Steps

Complete the following steps to replace the fan unit.

1 Unscrew screw locks and disconnect power and alarm cable from fan unit on the Alcatel-Lucent 1665 DMX shelf or the Alcatel-Lucent 1665 DMX high capacity shelf.

2 Back out the screws securing the fan unit and loosen mounting screws that attach the fan bracket to the frame.

Reference: Figure 14-17, “Alcatel-Lucent 1665 DMX fan unit screws” (p. 14-115) illustrates the location of the screws on the Alcatel-Lucent 1665 DMX shelf.

Figure 14-17 Alcatel-Lucent 1665 DMX fan unit screws

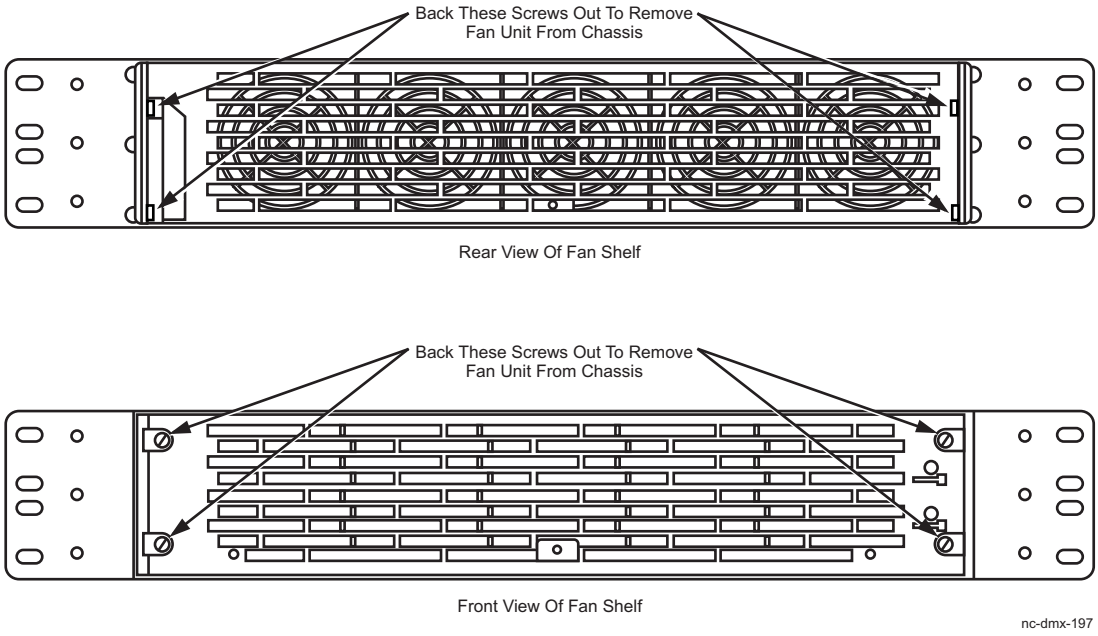
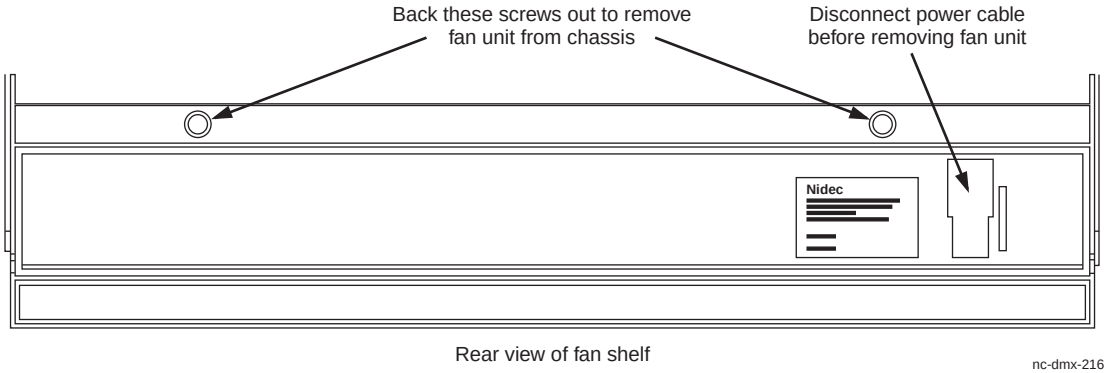


Figure 14-18, “Alcatel-Lucent 1665 DMX High Capacity shelf fan unit screws” (p. 14-115) illustrates the location of the screws on the Alcatel-Lucent 1665 DMX High Capacity shelf.

Figure 14-18 Alcatel-Lucent 1665 DMX High Capacity shelf fan unit screws



3 Slide the old fan unit out from the fan chassis.

4 Slide the new fan unit back into the fan chassis. Tighten all screws located in the front and back of the fan unit for the Alcatel-Lucent 1665 DMX shelf or the Alcatel-Lucent 1665 DMX high capacity shelf.

Hand tighten the #4 steel thread fasteners until "snug tight" and then 1/2 turn with a wrench/screwdriver (torque should be approximately 8 in-lb).

5 Reconnect the power and alarm cable to the back of the fan shelf on the Alcatel-Lucent 1665 DMX shelf or the Alcatel-Lucent 1665 DMX high capacity shelf.

END OF STEPS

Procedure 14-23: Establish external test access session in the MON(E or EF) mode

Overview

Use this procedure to establish a new external test access session in the following test access modes:

- MONE
- MONEF

To establish an internal test access session in the MONE mode, refer to Procedure 14-31: "Establish internal test access session in the MONE mode" (p. 14-150).

A new external test access session can be created only in the MONE or MONEF test access mode initially. To change the test access mode of an existing test access session, refer to Procedure 14-25: "Change test access mode of external test access session" (p. 14-132).

Important! The Tributary Maintenance parameter for the affected connected tributaries must be provisioned *Allow* to perform this procedure. If the Tributary Maintenance parameter for the affected connected tributaries is provisioned *Inhibit*, test access commands for the affected ports are denied. Unconnected tributaries are always available for test access.

To view the Tributary Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Tributary Maintenance** to access the required tributary.

To provision the Tributary Maintenance parameter, a Privileged user must perform Procedure 7-23: "Allow/inhibit port/tributary maintenance" (p. 7-61).

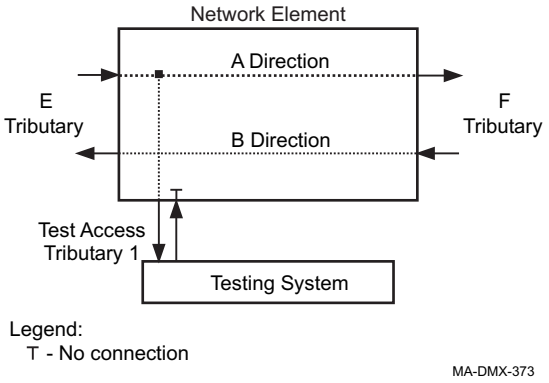
Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

MONE mode

The MONE mode is used to monitor the E Tributary input signal of a one-way cross-connection, a two-way cross-connection, or an idle E Tributary input signal (no cross-connection).

The following figure shows an example of the MONE mode used to monitor the E Tributary input signal of a two-way cross-connection.

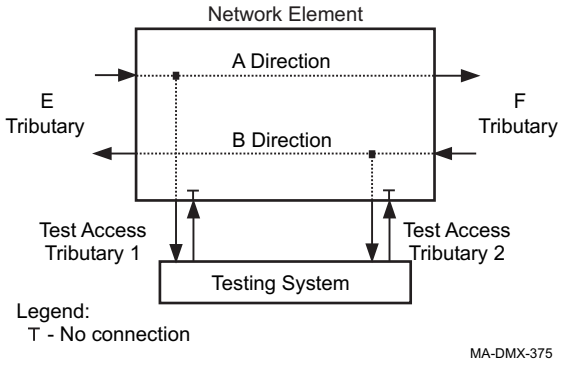


If the F Tributary is entered, the F Tributary must be the destination of a one-way cross-connection that has the E Tributary as the source, or the F Tributary must be part of a two-way cross-connection that does not have any other test access sessions on it. If the E Tributary is part of a two-way multicast cross-connection, entering the F Tributary is optional. The system automatically retrieves the other end. The E Tributary or F Tributary cannot be on an Ethernet circuit pack.

MONEF mode

The MONEF mode is used to monitor the E Tributary input signal and the F Tributary input signal of a two-way cross-connection.

The following figure shows an example of the MONEF mode used to monitor two tributaries.



The E Tributary, F Tributary, and two test access tributaries are required. If the E Tributary is part of a two-way cross-connection, entering the F Tributary is optional. The MONEF mode is not supported for tributaries that have one-way cross-connections or idle tributaries (no cross-connections). The E Tributary or F Tributary cannot be on an Ethernet circuit pack.

VT1.5 test access matrix

The "dual tatrib" modes (MONEF and SPLTEF) of VT test access are not possible when the system is equipped with small/medium VT fabric Main OLIUs. This applies to all systems equipped with OC3 or OC12 Main OLIUs.

The table below provides all the VT1.5 test access specifications supported by Alcatel-Lucent 1665 DMX. The numbers in the table below indicate the software release number in which that configuration is first supported.

Table 14-1 VT1.5 test access

TATRIBs									
		Slot	Signal	A-D slots			A-G slots[1] unprotected 1+1 only[2]		
				EC1	TMUX	DS1/E1	OC-3	OC-12	OC-48
				LNW16 LNW19B LNW20	LNW18 LNW20	LNW7 LNW8 LNW801	LNW37 LNW45 LNW55	LNW49 LNW55	LNW31 LNW55 LNW62
ETRIB and FTRIB	Main Add/Drop VT1.5 XC to:[5], [6]	A–D	DS3/EC1[3]	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			TMUX	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			DS1/E1	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
		A–G	OC-3/12/48	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
	DS1/E1/TMUX (FNA–D) VT1.5 hairpin to:[5], [6]	A–D	DS3/EC1[3]	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			TMUX	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			DS1/E1	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
		A–G	OC-3/12/48	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
	OC3/12 /48 (FN A–G) VT1.5 hairpin to:[5], [6]	A–D	DS3/EC1[3]	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			TMUX	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			DS1/E1[6]	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
		A–G	OC-3/12/48	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0
			TMUX (LNW20 portless only)	R7.0	R7.0	R7.0	R7.0	R7.0	R7.0
		M1/M2	OC-12/48/192[8]	R4.0	R4.0	R4.0	R4.0	R5.1	R4.0

Notes:

1. TATRIB1 and TATRIB2 are always connected to the same optical interface.
2. Intended for unprotected interfaces to locally-connected testheads only; Network-connected testheads - Future\

3. EC1 mode interfaces only.
4. Large VT Fabric Mains Only; restrictions apply for any OC3/12 Main OLIU.
5. Test Access of locked cross-connections restricted to electrical TATRIBs
6. Test Access of UPSR Dual Ring Interworking cross-connections not supported
7. Test access of low-speed BLSR cross-connections not supported
8. All high-speed Main OLIUs allow the STS-1 test access modes specified in this table. Generation and detection of PRBS only supported on the LNW59, LNW82, and LNW504.

STS-1 test access matrix

The table below provides all the STS-1 test access specifications supported by Alcatel-Lucent 1665 DMX. The numbers in the table below represent the software release number in which that configuration is first supported. Test access on STS-3(c) signals is only supported in SPLTA, SPLTE, and MONE modes using the internal test head located in the VLF Main packs for PRBS generation/detection

Table 14-2 STS-1 test access

TATRIBs								
		Slot	Signal	A-D slots (elect)		A-G slots[1] 1+1 only[2] (opt)		
				DS3/EC1	TMUX	OC-3	OC-12	OC-48
				LNW16 LNW19B LNW20	LNW18 LNW20	LNW37 LNW45 LNW55	LNW49 LNW55	LNW31 LNW55 LNW62
ETRIB and FTRIB	Main Add/Drop STS1 XC To:[4], [5]	A–G	DS3/EC1	R4.0	Deny	R4.0	R5.1	R4.0
		A–G	OC-3/12/48, [6]	R4.0	Deny	R4.0	R5.1	R4.0
	Thru XC		BLSR	R4.0	Deny	R4.0	R5.1	R4.0
			UPSR	R5.1	Deny	R5.1	R5.1	R5.1
	DS3/EC1 (FN A–D) hairpin to:[4], [5]	A–G	DS3/EC1	R4.0	Deny	R4.0	R5.1	R4.0
		A–G	OC-3/12/48, [6]	R4.0	Deny	R4.0	R5.1	R4.0
			TMUX[8]	R7.0	R7.0	R7.0	R7.0	R7.0
	OC3/12/48 (FN A–G) hairpin to:[4], [5]	A–D	DS3/EC1	R4.0	Deny	R4.0	R5.1	R4.0
		A–G	OC-3/12/48, [6]	R4.0	Deny	R4.0	R5.1	R4.0
	OC-192[7] (M1/M2) hairpin to:	M1/M2	OC-192	R7.0	R7.0	R7.0	R7.0	R7.0

Notes:

1. TATRIB1 and TATRIB2 are always connected to the same optical interface.
2. Intended for network-connected testheads where the tributary under test is in one NE and the test head is connected to a different NE.
3. EC1 mode interfaces only.
4. Test Access of locked cross-connections restricted to electrical TATRIBs
5. Test Access of UPSR Dual Ring Interworking cross-connections is not supported
6. Test access of low-speed BLSR cross-connections is not supported
7. All high-speed Main OLIUs allow the STS-1 test access modes specified in this table. Hairpins from high-speed Main interfaces to other high-speed Main interfaces only allowed on the LNW59 because it is the only Main OC-192 pack with multiple ports. Generation and detection of PRBS only supported on the LNW59.

8. TMUX test access in the G slots only supported using the LNW20 in portless mode.

Restrictions

The following restrictions apply when establishing an external test access session in the MON(E or EF) mode.

- A new external test access session can be created only in the MONE or MONEF test access mode initially.
- A new test access session is denied if a node or ring network upgrade is active (node is in provisioned Ring Upgrade mode).
- A new test access session is denied if a transmission test, loopback, or test access session is already active on an affected port.
- If the Main slots are equipped with LNW26B, LNW28, LNW48, LNW50, LNW77, or LNW121B–159B circuit packs, the VT1.5 test access cross-connection capacity is limited because of the small VT switch fabric. Therefore, it is recommended that you use only the MONE or SPLTE mode and avoid using ports on the LNW6 and LNW7 circuit packs for the E Tributary, F Tributary, and Test Access Tributaries.
- If the E Tributary or F tributary is part of a locked DSn cross-connection, the Test Access Tributary connected to the optical side of the locked DSn cross-connection must be an idle tributary of an electrical interface with a matching rate.
- Test Access of UPSR Dual Ring Interworking cross-connections is not supported.
- Test Access of VT1.5 pass-through cross-connections (UPSR/BLSR) is not supported.
- Up to 12 simultaneous test access sessions are supported, regardless of the test access rate and type (external or internal).



NOTICE

Service-disruption hazard

Service interruptions may occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested and the test access tributary(ies). Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

4. Verify that the work instructions identify the test access mode, test access rate, and the assigned addresses (AIDs) of the tributary(ies) to be tested and the test access tributary(ies).
5. If the work instructions specify optical test access tributaries are to be used, verify that 1+1 optical interfaces to locally-connected testheads exist. If required, refer to Procedure 9-11: "Establish low-speed 1+1 unprotected linear optical extension" (p. 9-137) to establish a 1+1 interface to the local testhead.

Steps

Complete the following steps to establish a new external test access session in the MON(E or EF) mode.

1 Verify that the Test Access Tributary *Tributary Monitoring Mode* parameter is provisioned *NMON*. Select **View** → **Equipment**. Expand the required circuit pack and port details, highlight the required tributary, and click **Select** to obtain a list of tributary parameters.

2 If required, provision the Test Access Tributary *Tributary Monitoring Mode* parameter to *NMON* to avoid possible alarms. Select **Configuration** → **Equipment**. Expand the required circuit pack and port details, highlight the required tributary, and click **Select**. Provision the *Tributary Monitoring Mode* parameter to *NMON*. Click **Apply** and **Close**.

3 If creating a new test access session between a low-speed electrical port (for example, DS1 or DS3) and a Test Access Tributary, provision the low-speed electrical port *Port Monitoring Mode* parameter to *NMON* to avoid possible alarms. Select **Configuration** → **Equipment**. Expand the required low-speed electrical circuit pack details, highlight the required low-speed electrical port, and click **Select**. Provision the *Port Monitoring Mode* parameter to *NMON*. Click **Apply** and **Close**.

4 If creating a new test access session between a BLSR tributary and a Test Access Tributary, disable Ring Circuit Audit Alarm reporting for the BLSR protection group. Select **Configuration** → **Equipment**. Click on the *Ptn Grp* tab, highlight the required 2F BLSR protection group, and click **Select**. Disable the *Ring Circuit Audit* or *Ring Circuit Alarm Mode* parameter. Then click **Apply** and **Close**.

5 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

6 Click **Create a new test access session**, **External Test Session**, and **Next**.

7 Follow the directions in the remaining *Test Access Wizard* screens to create a new external test access session in the MONE or MONEF test access mode at the STS-1 or VT1.5 rate according to the work instructions.

8 **Important!** A test access session remains in effect until deleted.

Verify the test access session parameters, then click **Finish** at the end of the *Test Access Wizard* screens.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the *Test Access Wizard* appears.

9 Click **View existing test access sessions** and **Next**.

Result: A list of existing test access sessions appears.

10 Verify that the required test access session was created and click **Close**.

END OF STEPS

Procedure 14-24: Establish external test access session in the SPLT(E or EF) mode

Overview

Use this procedure to establish a new external test access session in the following test access modes:

- SPLTE
- SPLTEF

To establish an internal test access session in the SPLT(A or E) mode, refer to Procedure 14-32: “Establish internal test access session in the SPLT(A or E) mode” (p. 14-154).

Important! Initially, an external test access session *must* be established in the MONE or MONEF test access mode and then changed:

- From MONE to SPLTE
- From MONEF to SPLTEF

Important! The Tributary Maintenance parameter for the affected connected tributaries must be provisioned *Allow* to perform this procedure. If the Tributary Maintenance parameter for the affected connected tributaries is provisioned *Inhibit*, test access commands for the affected ports are denied. Unconnected tributaries are always available for SPLTE test access.

To view the Tributary Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Tributary Maintenance** to access the required tributary.

To provision the Tributary Maintenance parameter, a Privileged user must perform Procedure 7-23: “Allow/inhibit port/tributary maintenance” (p. 7-61).

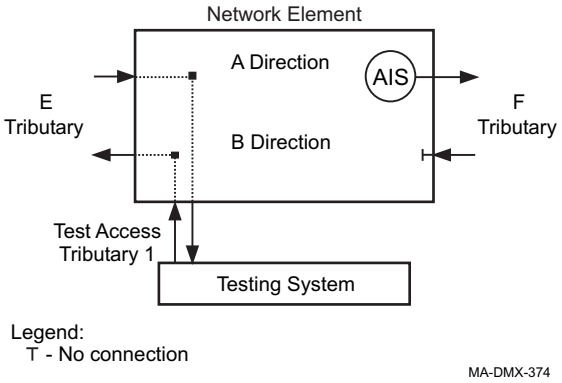
Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

SPLTE mode

The SPLTE mode is used to test the E Tributary signal.

The following figure shows an example of the SPLTE mode used to test the E Tributary signal of a two-way cross-connection.

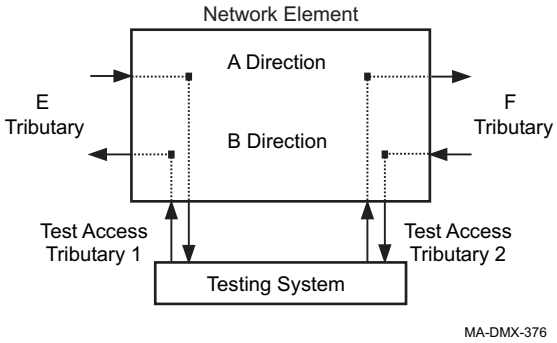


The E Tributary signal is split from the F Tributary signal. AIS is transmitted on the outgoing F Tributary signal and the incoming F Tributary signal is terminated. If there is a one-way cross-connection from the E Tributary to F Tributary, AIS is transmitted on the outgoing F Tributary signal. The E Tributary can also be idle (no cross-connection). The E Tributary or F Tributary cannot be on an Ethernet circuit pack.

SPLTEF mode

The SPLTEF mode is used to test the E Tributary signal and F Tributary signal.

The following figure shows an example of the SPLTEF mode used to test the E Tributary signal and F Tributary signal of a two-way cross-connection.



Two test access tributaries are required. If the E Tributary is part of a two-way cross-connection, entering the F Tributary is optional. The SPLTEF mode is not supported for tributaries that have one-way cross-connections or idle tributaries (no cross-connections). The E Tributary or F Tributary cannot be on an Ethernet circuit pack.

Supported VT1.5 rate test access configurations

The following table shows the E Tributaries and F Tributaries (VT1.5 cross-connections) and the supported Test Access Tributaries.

				Test Access Tributaries				
				A-D Slots			A-G Slots[1] - 1+1 Only[2]	
				EC1	TMUX	DS1/E1	OC-3/12	OC-48
				LNW16 LNW19 LNW19B LNW20[7]	LNW18 LNW20[7]	LNW6 LNW7 LNW8	LNW36 LNW37 LNW45 LNW46 LNW49	LNW31 LNW62
E Tributary and F Tributary[3]	Main Add/Drop VT1.5 Cross-Connection to:[5, 6]	FN A-D G[9]	DS3/EC1[4]	✓	✓	✓	✓	✓
			TMUX[8]	✓	✓	✓	✓	✓
			DS1/E1	✓	✓	✓	✓	✓
		FN A-G	OC-3/12/48	✓	✓	✓	✓	✓
E Tributary and F Tributary[3]	DS1/EC1/TMUX (FN A-D) VT1.5 Hairpin Cross-Connection to:[5, 6]	FN A-D G[9]	DS3/EC1[4]	✓	✓	✓	✓	✓
			TMUX[8]	✓	✓	✓	✓	✓
			DS1/E1	✓	✓	✓	✓	✓
		FN A-G	OC-3/12/48	✓	✓	✓	✓	✓
	OC-3/12/48 (FN A-G) VT1.5 Hairpin Cross-Connection to:[5, 6]	FN A-D G[9]	DS3/EC1[4]	✓	✓	✓	✓	✓
			TMUX[8]	✓	✓	✓	✓	✓
			DS1/E1	✓	✓	✓	✓	✓
		FN A-G	OC-3/12/48	✓	✓	✓	✓	✓

[1] Test Access Tributary 1 and Test Access Tributary 2 are always connected to the same optical interface.

[2] Intended for 1+1 interfaces (port Application parameter = 1+1) to locally-connected testheads only.

[3] Main OLIUs with large VT switch fabric or Very Large Fabric (VLF) only. Restrictions apply to LNW26B, LNW28, LNW48, LNW50, LNW77, and LNW121B–159B OLIU circuit packs.

[4] EC-1 interfaces only.

[5] Test Access of locked cross-connections restricted to electrical test access tributaries.

[6] Test Access of UPSR Dual Ring Interworking and UPSR/BLSR pass-through cross-connections is not supported.

[7] LNW20 48TMUXDS3EC1 Ported only.

[8] LNW20 48TMUXDS3EC1 Ported or Portless.

[9] LNW20 48TMUXDS3EC1 Portless only.

Supported STS-1 rate test access configurations

The following table shows the E Tributaries and F Tributaries (STS-1 rate cross-connections) and the supported Test Access Tributaries.

				Test Access Tributaries		
				A-D Slots	A-G Slots[1] - 1+1 Only[2]	
				DS3/EC1	OC-3/12	OC-48
				LNW16 LNW19 LNW19B LNW20[6]	LNW36 LNW37 LNW45 LNW46 LNW49	LNW31 LNW62
E Tributary and F Tributary	Main Add/Drop STS-1 Cross-Connection to: [3, 4]	FN A-D G[8]	DS3/EC1 TMUX[7]	✓	✓	✓
		FN A-G	OC-3/12/48[5]	✓	✓	✓
	Thru STS-1 Cross-Connection		BLSR	✓	✓	✓
			UPSR	✓	✓	✓
E Tributary and F Tributary	DS3/EC-1 (FN A-D) STS-1 Hairpin Cross-Connection to: [3, 4]	FN A-D G[8]	DS3/EC1 TMUX[7]	✓	✓	✓
		FN A-G	OC-3/12/48[5]	✓	✓	✓
	OC-3/12/48 (FN A-G) STS-1 Hairpin Cross-Connection to: [3, 4]	FN A-D G[8]	DS3/EC1 TMUX[7]	✓	✓	✓
		FN A-G	OC-3/12/48[5]	✓	✓	✓

[1] Test Access Tributary 1 and Test Access Tributary 2 are always connected to the same optical interface.

[2] Intended for 1+1 interfaces (port Application parameter = 1+1) to locally-connected testheads only.

[3] Test Access of locked cross-connections restricted to electrical test access tributaries.

[4] Test Access of UPSR Dual Ring Interworking cross-connections is not supported.

[5] Test access of low-speed BLSR cross-connections is not supported.

[6] LNW20 48TMUXDS3EC1 Ported only.

[7] LNW20 48TMUXDS3EC1 Ported or Portless.

[8] LNW20 48TMUXDS3EC1 Portless only.

Restrictions

The following restrictions apply when establishing an external test access session in the SPLT(E or EF) mode.

- A new external test access session must be created only in the MONE or MONEF test access mode initially and then changed from MONE to SPLTE, or from MONEF to SPLTEF.
- A new test access session is denied if a node or ring network upgrade is active (node is in provisioned Ring Upgrade mode).
- A new test access session is denied if a transmission test, loopback, or test access session is already active on an affected port.
- If the Main slots are equipped with LNW26B, LNW28, LNW48, LNW50, LNW77, or LNW121B–159B circuit packs, theVT1.5 test access cross-connection capacity is limited because of the small VT switch fabric. Therefore, it is recommended that you use only the MONE or SPLTE mode and avoid using ports on the LNW6 and LNW7 circuit packs for the E Tributary, F Tributary, and Test Access Tributaries.
- If the E Tributary or F tributary is part of a locked DSn cross-connection, the Test Access Tributary connected to the optical side of the locked DSn cross-connection must be an idle tributary of an electrical interface with a matching rate.
- Test Access of UPSR Dual Ring Interworking cross-connections is not supported.
- Test Access of VT1.5 pass-through cross-connections (UPSR/BLSR) is not supported.



NOTICE

Service-disruption hazard

Service interruptions can occur on tributaries if they are accidentally tested. Service interruptions may also occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested and the test access tributary(ies). Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to “Before you begin” (p. 14-3) and “Required equipment” (p. 14-3) in this chapter.
2. Refer to “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.
3. Obtain the work instructions for this procedure.

4. Verify that the work instructions identify the test access mode, test access rate, and the assigned addresses (AIDs) of the tributary(ies) to be tested and the test access tributary(ies).
5. If the work instructions specify optical test access tributaries are to be used, verify that 1+1 optical interfaces to locally-connected testheads exist. If required, refer to Procedure 9-11: "Establish low-speed 1+1 unprotected linear optical extension" (p. 9-137) to establish a 1+1 interface to the local testhead.

Steps

Complete the following steps to establish a new external test access session in the SPLT(E or EF) mode.

1 **Important!** Initially, an external test access session *must* be established in the MONE or MONEF test access mode and then changed from MONE to SPLTE or from MONEF to SPLTEF.

Establish the required external test access session in the MONE or MONEF test access mode.

If an external test access session is required in the...	Then establish a new external test access session in the...
SPLTE mode,	MONE test access mode.
SPLTEF mode,	MONEF test access mode.

Reference: Procedure 14-23: "Establish external test access session in the MON(E or EF) mode" (p. 14-117)

2 Change the test access mode of the test access session established in the previous step as required from:

- MONE to SPLTE
- MONEF to SPLTEF

Reference: Procedure 14-25: "Change test access mode of external test access session" (p. 14-132)

END OF STEPS

Procedure 14-25: Change test access mode of external test access session

Overview

Use this procedure to change the test access mode of an existing external test access session among the following groups of test access modes:

- MONE, SPLTE
- MONEF, SPLTEF

To change an existing internal test access session, refer to Procedure 14-33: “Change test access mode of internal test access session” (p. 14-158).

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Restrictions

The following restrictions apply to test access.

- A new external test access session can be created only in the MONE or MONEF test access mode initially.
- If the Main slots are equipped with LNW26B, LNW28, LNW48, LNW50, LNW77, or LNW121B–159B circuit packs, the VT1.5 test access cross-connection capacity is limited because of the small VT switch fabric. Therefore, it is recommended that you use only the MONE or SPLTE mode and avoid using ports on the LNW6 and LNW7 circuit packs for the E Tributary, F Tributary, and Test Access Tributaries.



NOTICE

Service-disruption hazard

Service interruptions can occur on tributaries if they are accidentally tested. Service interruptions may also occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested and the test access tributary(ies). Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the test access mode, test access rate, and the assigned addresses (AIDs) of the tributary(ies) to be tested and the test access tributary(ies).

Steps

Complete the following steps to change the test access mode of an existing external test access session.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **Modify an existing test access session's mode** and **Next**.

3 **Important!** The test access mode changes are limited between MONE and SPLTE or MONEF and SPLTEF.

Follow the directions in the remaining *Test Access Wizard* screens to change the test access mode of the required test access session.

4 **Important!** A test access session remains in effect until deleted.

Verify the test access session parameters, then click **Finish** at the end of the *Test Access Wizard* screens.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the *Test Access Wizard* appears.

5 Click **View existing test access sessions** and **Next**.

Result: A list of existing test access sessions appears.

6 Verify that the required test access session was changed and click **Close**.

END OF STEPS

Procedure 14-26: Delete test access session

Overview

Use this procedure to delete an existing test access session.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the test access session to be deleted.

Steps

Complete the following steps to delete an existing test access session.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **Delete an existing test access session** and **Next**.

3 Follow the directions in the remaining *Test Access Wizard* screens to delete the required test access session.

4 Verify the test access session parameters, then click **Finish** at the end of the *Test Access Wizard* screens.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the *Test Access Wizard* appears. Click **Close**.

END OF STEPS

Procedure 14-27: View test access sessions

Overview

Use this procedure to view the existing test access sessions on a network element.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

Steps

Complete the following steps to view the existing test access sessions on a network element.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **View existing test access sessions** and **Next**.

Result: A list of existing test access sessions appears.

3 Click **Close** to exit.

END OF STEPS

Procedure 14-28: View reports

Overview

Use this procedure as reference for viewing the following reports that are accessible from the System View **Reports** menu:

- Equipment Lists
- Status Lists
- Path Protection List
- BLSR Protection Switch List
- NE Alarm List
- Remote NE Alarm List
- Alarm Severity Assignment Profile User List
- VT XC Fabric Utilization
- Backplane Bandwidth Utilization
- NE History Log
- NE Security Log
- MAC Address List
- GbE Line Utilization.

Privilege level

You must log in as a Privileged, General, Maintenance, or Reports Only user to complete this procedure.

Before you begin

Prior to performing this procedure, refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.

Steps

Use the sections in this procedure as reference for viewing reports that are accessible from the System View **Reports** menu only.

1 Reference the sections in this procedure to view the desired reports.

END OF STEPS

Equipment lists

The Equipment Lists show the address identifiers (AIDs), hardware codes, and/or parameter values for circuit packs, pluggable transmission modules, ports, VCGs, tributaries and miscellaneous discretes.

The following commands are used to obtain Equipment Lists.

- **Reports → Equipment Lists → Pack**
- **Reports → Equipment Lists → Pluggable Transmission Module**
- **Reports → Equipment Lists → Port**
- **Reports → Equipment Lists → VCG**
- **Reports → Equipment Lists → Trib**
- **Reports → Equipment Lists → Misc. Discretes**

Status lists

The Status Lists show status/state information for circuit packs, pluggable transmission modules, ports, VCGs, and tributaries.

The following commands are used to obtain Status Lists.

- **Reports → Status Lists → Pack**
- **Reports → Status Lists → Pluggable Transmission Module**
- **Reports → Status Lists → Port**
- **Reports → Status Lists → VCG**
- **Reports → Status Lists → Trib**

Path protection list

The Path Protection List shows the status of UPSR paths on the shelf. The **Reports → Path Protection List** command is used to obtain a Path Protection List.

BLSR protection switch list

The BLSR Protection Switch List shows the protection switch status of the BLSRs on the shelf. The **Reports → BLSR Protection Switch List** command is used to obtain a BLSR Protection Switch List.

NE alarm list

The NE Alarm List shows detailed information about the current alarms on the shelf. The **Reports → NE Alarm List** command is used to obtain an NE Alarm List.

The NE Alarm List may be filtered by Alarm Category, Alarm Level, Effect on Service, and Alarm Entity Type.

Remote NE alarm list

If the remote network element status feature is enabled, the Remote NE Alarm List shows the highest alarm/status level for each network element in the alarm group. The **Reports** → **Remote NE Alarm List** command is used to obtain an Remote NE Alarm List.

Alarm Severity Assignment Profile user list

The Alarm Severity Assignment Profile user list shows the entities that are assigned to the selected Alarm Severity Assignment Profile. The **Reports** → **Alarm Severity Assignment Profile User List** command is used to obtain an Alarm Severity Assignment Profile User List.

VT XC Fabric utilization

VT XC Fabric Utilization shows the VT cross-connect fabric utilization for the main and function packs on the shelf. The **Reports** → **VT XC Fabric Utilization** command is used to obtain a VT XC Fabric Utilization report.

Backplane bandwidth utilization

Backplane Bandwidth Utilization shows the backplane utilization for STS and VT cross-connections for any function packs on the shelf. The **Reports** → **Backplane Bandwidth Utilization** command is used to obtain a Backplane Bandwidth Utilization report.

NE history log

The NE History Log shows the start and end of alarm and status conditions and all CIT/OS activities that affect the state of the network element. This includes autonomous events such as alarms, protection switching, maintenance conditions, and network element status changes. The **Reports** → **NE History Log** command is used to obtain an NE History Log.

The network element stores up to 12,000 of the most recent events. All entries or only entries for a specified time interval may be retrieved.

NE security log

The NE Security Log shows all TL1 provisioning commands and security-related events. For example, user authentication attempts, attempts to access resources, user security changes, network element security changes, and system resets are shown. The **Reports** → **NE Security Log** command is used to obtain an NE Security Log.

The network element stores up to 10,000 of the most recent events. All entries or only entries for a specified time interval may be retrieved.

MAC address list

The MAC address list displays the source and destination addresses (stored in the MAC address table) of data packets. Persistent and Filtered MAC addresses are entered manually via the **Configuration** → **Data** → **Create MAC Address** command and Dynamic MAC addresses are learned when a packet enters the switch. The **Reports** → **MAC Address List** command is used to obtain the MAC Address List.

The MAC Address List may be filtered by VLAN/Port Tag ID, MAC Address, and/or Address Type (Persistent, Filtered, Dynamic, or All).

GbE line utilization

The GbE line utilization report shows how much data bandwidth has been used per Ethernet and VCG port. The information generated for the report is based on performance monitoring data. The **Reports** → **GbE Line Utilization** command is used to obtain a GbE Line Utilization report.

Procedure 14-29: Clean optical pluggable transmission module

Overview

This procedure describes the Alcatel-Lucent recommended method for cleaning *uninstalled* optical pluggable transmission modules using specific tools and materials that have been proven to be effective in the assembly and testing of optical transmission equipment.

Important! Pluggable transmission modules are shipped with a dust cover installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust cover be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable transmission modules should not be necessary.

Because a major source of contamination is often a contaminated mating connector, it is extremely important to clean the connector ferrule end surface each time before making connections. To clean the connector ferrule end surface, refer to Procedure 14-3: “Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)” (p. 14-38).

Required equipment

The following equipment is required to perform this procedure.

- CLETOP stick cleaner (1.25 mm for LC connectors)
- Canned dry nitrogen or air (electronics grade)
- Stereo zoom scope with coaxial illumination (200x)

Before you begin

Prior to performing this procedure, refer to “Laser safety” (p. 1-6) and “Electrostatic discharge” (p. 1-26) in Chapter 1, “Safety”.

Steps

Complete the following steps to clean an optical pluggable transmission module.

1 Remove the protective dust cover from the pluggable transmission module. Keep the dust cover clean until reinstalled later, if required.

2 

NOTICE

Corrosive-substance hazard

If the canned dry nitrogen or air is held upside down, inert gas may be released onto the connector surface. The inert gas leaves contamination on the connector surface that cannot be removed.

When performing this step hold the canned dry nitrogen or air upright.

While holding the canned dry nitrogen or air, position the tip of the nozzle extension as close as possible, but not close enough to make physical contact, to the sleeve inside the port receptacle and make three consecutive short blows (approximately one second each).

Repeat this step for the other port.

3 Using the stereo zoom scope, visually inspect the pluggable transmission module. If required, repeat Step 2 up to two more times then continue with the next step.

4 

NOTICE

Equipment damage hazard

Do not perform this step on the receive (RX) port. The receive (RX) port contains a lens for focusing a wide input. The lens is more easily scratched than cleaned.

This step should only be performed on the transmit (TX) port if the air blows did not work.

If required, insert a CLETOP stick into the transmit (TX) port sleeve until vertical force can be applied to the fiber stub end surface. Rotate the CLETOP stick five full rounds.

5 Using the stereo zoom scope, visually inspect the pluggable transmission module. If required, repeat Step 4.

6 **Important!** It is recommended that the dust cover be installed into the optical ports on the pluggable transmission module to maintain cleanliness until the optical fiber is connected.

If required, reinstall the dust cover into the optical ports to maintain cleanliness.

END OF STEPS

Procedure 14-30: Connect modems to establish communication from remote CIT location

Overview

Use this procedure to connect modems and a Personal Computer (PC) to the Alcatel-Lucent 1665 DMX for use in provisioning the system from a remote location.

This procedure is used only for modem access. For local access or access directly through a WAN or LAN network, refer to Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27).

This procedure presents two configurations:

- Dial-up networking to a TCP/IP LAN/WAN network. See example in Figure 14-19, "Dial-Up networking to TCP/IP LAN/WAN network" (p. 14-148).

  This configuration could be a dial-up networking connection to a corporate LAN/WAN network or an Internet connection using VPN tunneling to a corporate network. Once the connection to the TCP/IP LAN network is made, the connection to the network element is the same as being locally connected to the NE LAN port and using a TCP/IP connection type.
- Modem-to-Modem connection. See example in Figure 14-20, "Modem-to-Modem connection" (p. 14-149).

  The NE can be accessed remotely via dialup modems to the NE's modem serial port, but not by the *WaveStar*® CIT software.

  A PC with a terminal emulation software package, such as HyperTerminal, can be used for access to the modem serial port via dialup modems. The PC can use its internal modem or an external modem (as shown). This form of access supports TL1 messages only, and can be used to access remote NEs with DCC connectivity to the NE with the modem connection.

Privilege level

You must login as a Privileged user to complete this procedure.

Before you begin

Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.

Ensure that the descriptions and syntax of the various features and parameters of the Alcatel-Lucent 1665 DMX that may be set using the PC with the *WaveStar*® CIT program installed are understood prior to starting this procedure.

Ensure that the proper modem cable is available. Use the following table to determine the correct assembly:

Table 14-3 Modem cable assembly and pin connections

Description	Cable Assembly #	Cable Length	Alcatel-Lucent 1665 DMX Connections
Modem Cable	848756508	50 ft.	J17
	848756524	100 ft.	
	848756516	150 ft.	
	848756532	250 ft.	

Connection	RJ-45 Connector Pin #	Color	DB25 Connector Pin #
Modem Cable J17	1	White-Orange	8
	2	Brown	20
	3	White-Black	3
	5	Orange (and Shielding)	7
	6	Green	2

Review the following generic parameters to be set for the modem(s):

- 1200, 2400, 4800, 9600, or 19,200 baud *(9600 is the default and recommended rate)*
- Full duplex
- 8 data bits
- No parity bits
- 1 start bit
- 1 stop bit
- No flow control
- Transparent data mode - ON (Required for software download on some modems.)
- Direct operating mode - ON (Required for software download on some modems.)

  Important! Modems supporting a large set of options and error detection capabilities may require other options to be set before using the modems to download generic software. Refer to manufacture's manuals for instructions on setting modem parameters.

Steps

Complete the following steps to connect the modem(s) and establish communication from a remote *WaveStar*® CIT location.

1 At the Alcatel-Lucent 1665 DMX, is the connection being made through a direct modem-to-modem connection, or through dial-up networking using a TCP/IP LAN network?

If...	Then...
using dial-up networking to a TCP/IP LAN network,	Continue with Step 2.
using a modem-to-modem connection,	Proceed to Step 9.

2 At the Alcatel-Lucent 1665 DMX Location

Verify your network administrator has set up the TCP/IP network. Verify that a LAN port at the Alcatel-Lucent 1665 DMX is provisioned to accept TCP/IP connections and you know the IP address of your NE.

Reference: Procedure 7-15: “Provision TCP/IP and Proxy ARP on an IAO LAN port” (p. 7-43)

3 At the Remote *WaveStar*® CIT Location

Ensure the modem parameters are set correctly. Refer to manufacturer's manual for instructions on setting modem parameters.

4 If an external modem is being used at the remote *WaveStar*® CIT location, connect the modem to the *WaveStar*® CIT PC using the appropriate modem cable.

5 Verify the telephone line is plugged into the modem.

6 Refer to your local procedures for using dial-up networking to set up and establish a dial-up connection to your TCP/IP LAN network.

7 After you have connected to your TCP/IP LAN network, establish a *WaveStar*® CIT session to the Alcatel-Lucent 1665 DMX the same way you would if you were locally connected to the **LAN** port and using a TCP/IP connection type.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

8 STOP! End of Procedure.

9 At the Alcatel-Lucent 1665 DMX Location, Modem-to-Modem Connection

Connect a PC to the modem. Use the PC communications software to set the generic modem parameters specified in the "Before you begin" (p. 14-143) section of this procedure. Set the modem to answer incoming calls.

Enter the following AT commands:

- AT&D0 - tells modem to ignore DTR signal.
- ATE0 - disables local command echo on the modem.

Important! The above AT commands are important and are standard from modem to modem. These AT commands may need to be set using DIP switches on your modem. Refer to modem's owner manual for instructions.

For PC communications software such as HyperTerminal, "Echo typed characters locally" needs to be enabled since local command echo was disabled on the modem. For HyperTerminal, go to File → Properties → Settings → ASCII Setup.

10 Connect the modem to the rear *WaveStar*® CIT interface (CIT-2 [J17]) on the Alcatel-Lucent 1665 DMX shelf using the proper Alcatel-Lucent 1665 DMX modem cable.

11 Plug the telephone line into the modem.

12 If not already performed, establish a *WaveStar*® CIT session with the Alcatel-Lucent 1665 DMX shelf.

Reference: Procedure 14-2: "Connect Personal Computer (PC) and establish *WaveStar*® CIT session" (p. 14-27)

13 From the System View menu, select **Administration** → **Data Communications**. Click on the **Serial Port** tab, set the options of the **CIT Port (cit-2)** serial port. Be sure to set **Echo Mode** to **Disable**. Click **Apply**, read the warning message, then click **Yes** to execute the command. Click **Close** to exit.

The Alcatel-Lucent 1665 DMX shelf has a default setting of 9600 baud for the serial port. If the modem is set for another baud rate (1200, 2400, 4800, or 19200), set the serial port baud rate to match that of the modem.

Reference: Procedure 7-18: "Provision RS232 CIT (CIT-1) and/or MODEM (CIT-2) serial port parameters" (p. 7-51)

14 At the Remote PC Location, Modem-to-Modem Connection

Use the PC communications software to set the generic modem parameters specified in the "Before you begin" (p. 14-143) section of this procedure. Refer to manufacture's manual for instructions on setting modem parameters.

Enter the following AT commands:

- AT&D2 - indicates the DTE controls DTR signal.
- ATE0 - disables local command echo on the modem.

Important! The above AT commands are important and are standard from modem to modem. These AT commands may need to be set using DIP switches on your modem. Refer to modem's owner manual for instructions.

15 If an external modem is being used at the remote PC location, connect the modem to the PC using the appropriate modem cable.

16 Verify the telephone line is plugged into the modem.

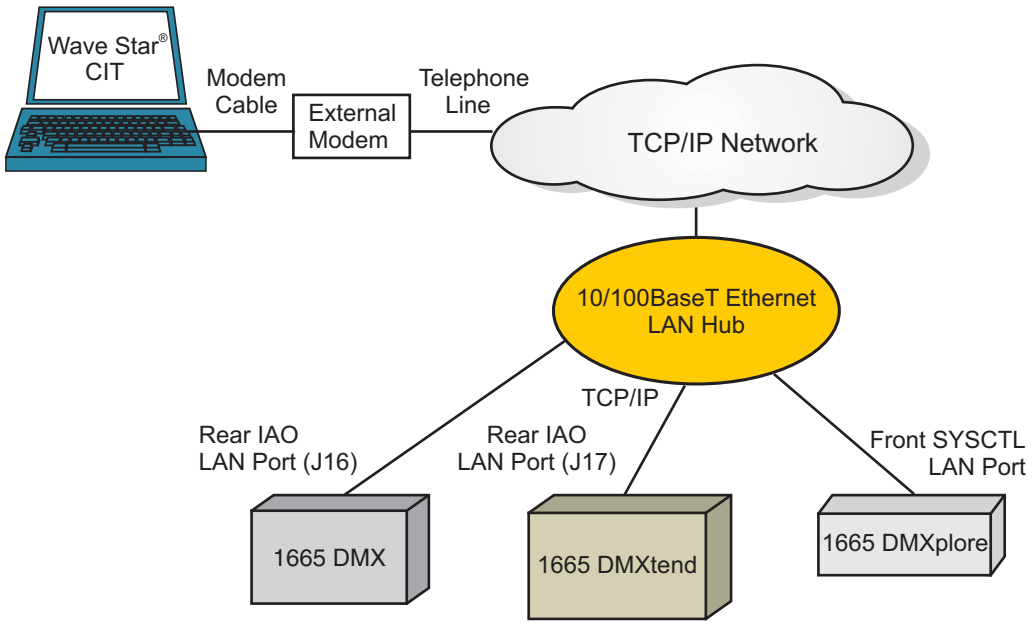
17 Refer to the PC and modem documentation, or use HyperTerminal, to establish a connection (place a call) to the modem at the Alcatel-Lucent 1665 DMX.

18 Once the modem at the Alcatel-Lucent 1665 DMX has answered, hit the Enter key twice and the TID of the NE should be displayed. Use TL1 commands to access the system.

Reference: *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*

END OF STEPS

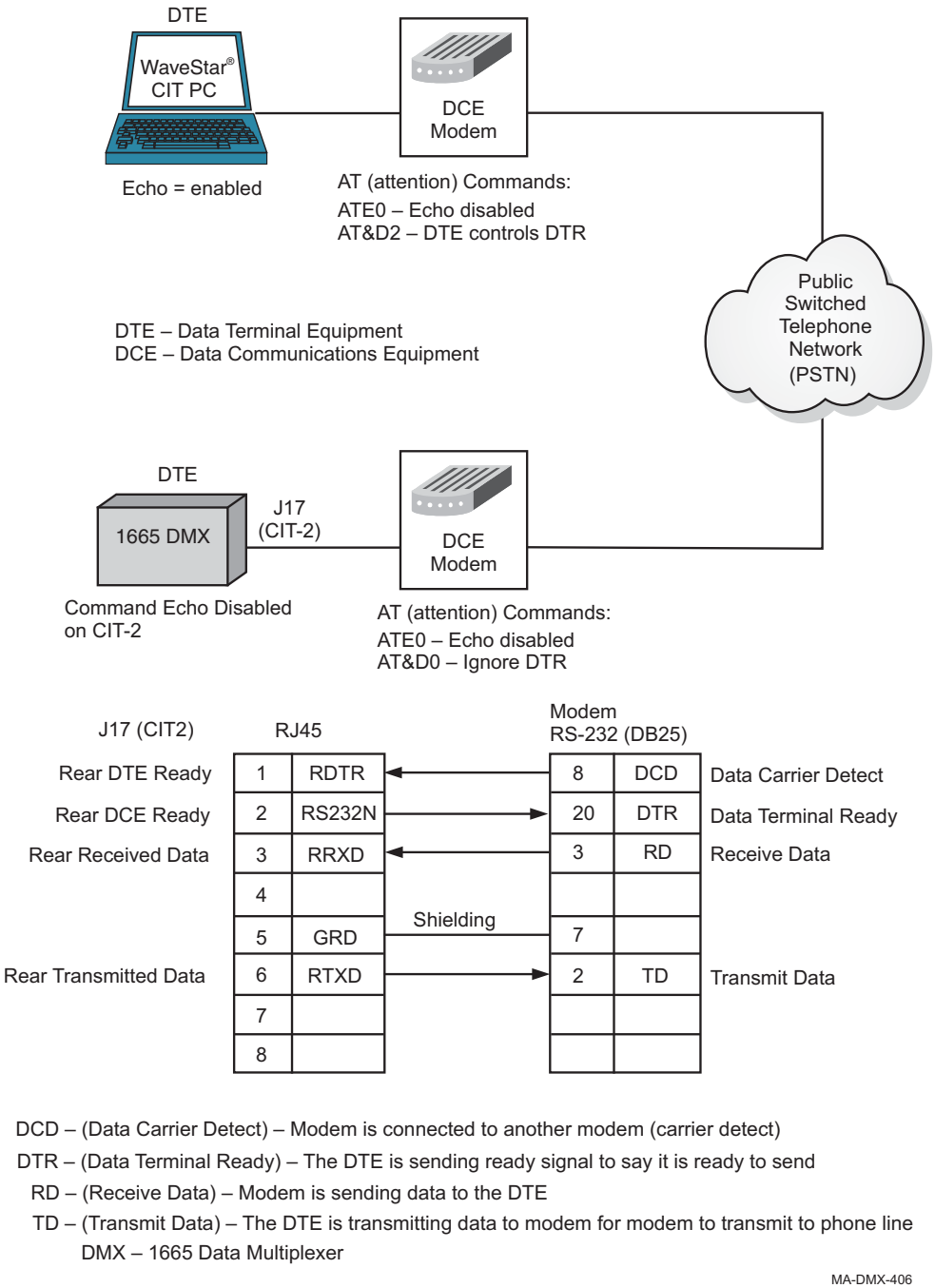
Figure 14-19 Dial-Up networking to TCP/IP LAN/WAN network



DMX = 1665 Data Multiplexer
DMXplore = 1665 Data Multiplexer Explore
DMXtend = 1665 Data Multiplexer Extend

MA-DMX-415

Figure 14-20 Modem-to-Modem connection



DCD – (Data Carrier Detect) – Modem is connected to another modem (carrier detect)

DTR – (Data Terminal Ready) – The DTE is sending ready signal to say it is ready to send

RD – (Receive Data) – Modem is sending data to the DTE

TD – (Transmit Data) – The DTE is transmitting data to modem for modem to transmit to phone line

DMX – 1665 Data Multiplexer

MA-DMX-406

Procedure 14-31: Establish internal test access session in the MONE mode

Overview

Important! The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.

Use this procedure to establish a new internal test access session in the MONE test access mode.

To establish a new external test access session in the MON(E or EF) mode, refer to Procedure 14-23: "Establish external test access session in the MON(E or EF) mode" (p. 14-117).

A new internal test access session can be created only in the MONE test access mode initially. To change the test access mode of an existing internal test access session, refer to Procedure 14-33: "Change test access mode of internal test access session" (p. 14-158).

Important! The Tributary Maintenance parameter for the affected connected tributaries must be provisioned *Allow* to perform this procedure. If the Tributary Maintenance parameter for the affected connected tributaries is provisioned *Inhibit*, test access commands for the affected ports are denied. Unconnected tributaries are always available for test access.

To view the Tributary Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Tributary Maintenance** to access the required tributary.

To provision the Tributary Maintenance parameter, a Privileged user must perform Procedure 7-23: "Allow/inhibit port/tributary maintenance" (p. 7-61).

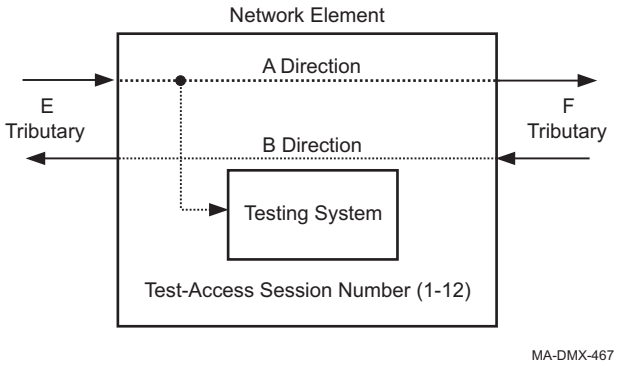
Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

MONE mode

The MONE mode is used to monitor the E Tributary input signal of a one-way cross-connection, a two-way cross-connection, or an idle E Tributary input signal (no cross-connection).

The following figure shows an example of the MONE mode used to monitor the E Tributary input signal of a two-way cross-connection.



If the F Tributary is entered, the F Tributary must be the destination of a one-way cross-connection that has the E Tributary as the source, or the F Tributary must be part of a two-way cross-connection that does not have any other test access sessions on it. If the E Tributary is part of a two-way multicast cross-connection, entering the F Tributary is optional. The system automatically retrieves the other end. The E Tributary or F Tributary cannot be on a DS1, DS3, TMUX, or Ethernet/Data circuit pack.

Restrictions

The following restrictions apply when establishing an internal test access session in the MONE mode.

- A new internal test access session can be created only in the MONE test access mode initially.
- A new test access session is denied if a node or ring network upgrade is active (node is in provisioned Ring Upgrade mode).
- A new test access session is denied if a transmission test, loopback, or test access session is already active on an affected port.
- Test Access of UPSR Dual Ring Interworking cross-connections is not supported.
- The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.
- Up to 12 simultaneous test access sessions are supported, regardless of the test access rate and type (external or internal).
- On LNW20 48TMUXDS3EC1 circuit packs, only DS3 Ported/Unchan and EC1 ports may be used for the E Tributary and F Tributary.



NOTICE

Service-disruption hazard

Service interruptions may occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested. Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the test access mode, test access rate, test access session number, and the addresses (AIDs) of the tributaries to be tested.

Steps

Complete the following steps to establish a new internal test access session in the MONE mode.

1 If creating a new internal test access session to an EC-1 port, provision the EC-1 port *Port Monitoring Mode* parameter to *NMON* to avoid possible alarms. Select **Configuration** → **Equipment**. Expand the required circuit pack details, highlight the required port, and click **Select**. Provision the *Port Monitoring Mode* parameter to *NMON*. Click **Apply** and **Close**.

2 If creating a new internal test access session to a BLSR tributary, disable Ring Circuit Audit Alarm reporting for the BLSR protection group. Select **Configuration** → **Equipment**. Click on the *Ptn Grp* tab, highlight the required 2F BLSR protection group, and click **Select**. Disable the *Ring Circuit Audit* or *Ring Circuit Alarm Mode* parameter. Then click **Apply** and **Close**.

3 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

4 Click **Create a new test access session**, **Internal Test Session**, and **Next**.

5 Follow the directions in the remaining *Test Access Wizard* screens to create a new internal test access session in the MONE test access mode at the STS-1 or STS-3 rate according to the work instructions.

6 **Important!** A test access session remains in effect until deleted.

Verify the test access session parameters, then click **Finish** at the end of the *Test Access Wizard* screens.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the *Test Access Wizard* appears.

7 Click **View existing test access sessions** and **Next**.

Result: A list of existing test access sessions appears.

8 Verify that the required test access session was created and click **Close**.

9 If required at this time, assign a test signal generator/detector to the internal test access session.

Reference: Procedure 14-34: “Assign/remove test signal generator/detector to internal test access session” (p. 14-161)

END OF STEPS

Procedure 14-32: Establish internal test access session in the SPLT(A or E) mode

Overview

Important! The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.

Use this procedure to establish a new internal test access session in the following test access modes:

- SPLTA
- SPLTE

To establish a new external test access session in the SPLT(E or EF) mode, refer to Procedure 14-24: "Establish external test access session in the SPLT(E or EF) mode" (p. 14-126).

Important! Initially, an internal test access session *must* be established in the MONE test access mode and then changed:

- From MONE to SPLTA
- From MONE to SPLTE

Important! The Tributary Maintenance parameter for the affected connected tributaries must be provisioned *Allow* to perform this procedure. If the Tributary Maintenance parameter for the affected connected tributaries is provisioned *Inhibit*, test access commands for the affected ports are denied. Unconnected tributaries are always available for SPLTE test access.

To view the Tributary Maintenance parameter, a Privileged, General, Maintenance, or Reports Only user must select **Administration** → **Allow/Inhibit Tributary Maintenance** to access the required tributary.

To provision the Tributary Maintenance parameter, a Privileged user must perform Procedure 7-23: "Allow/inhibit port/tributary maintenance" (p. 7-61).

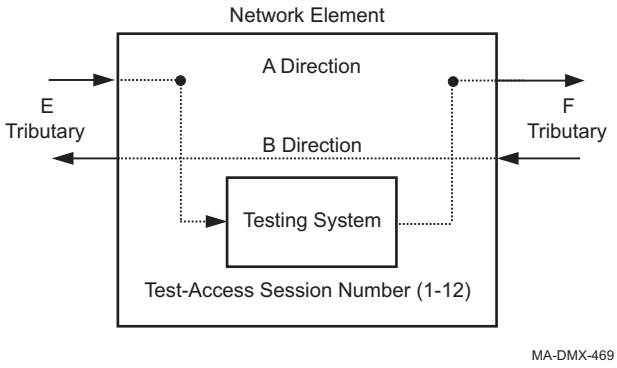
Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

SPLTA mode

The SPLTA mode is used to test a one-way cross-connection in the A Direction.

The following figure shows an example of the SPLTA mode used to test the E Tributary signal in the A Direction.

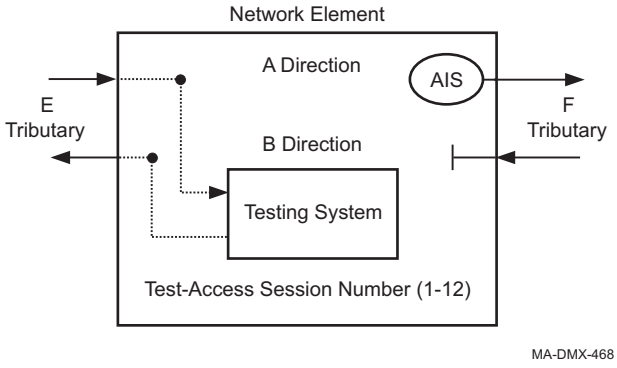


The A Direction of transmission is split. The E Tributary must be part of a cross-connection. The E Tributary cannot be on a DS1, DS3, TMUX, or Ethernet/Data circuit pack.

SPLTE mode

The SPLTE mode is used to test the E Tributary signal.

The following figure shows an example of the SPLTE mode used to test the E Tributary signal of a two-way cross-connection.



The E Tributary signal is split from the F Tributary signal. AIS is transmitted on the outgoing F Tributary signal and the incoming F Tributary signal is terminated. If there is a one-way cross-connection from the E Tributary to F Tributary, AIS is transmitted on the outgoing F Tributary signal. The E Tributary can also be idle (no cross-connection). The E Tributary or F Tributary cannot be on a DS1, DS3, TMUX, or Ethernet/Data circuit pack.

Restrictions

The following restrictions apply when establishing an internal test access session in the SPLT(A or E) mode.

- A new internal test access session must be created only in the MONE test access mode initially and then changed from MONE to SPLTA, or from MONE to SPLTE.
- A new test access session is denied if a node or ring network upgrade is active (node is in provisioned Ring Upgrade mode).
- A new test access session is denied if a transmission test, loopback, or test access session is already active on an affected port.
- Test Access of UPSR Dual Ring Interworking cross-connections is not supported.
- The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.
- On LNW20 48TMUXDS3EC1 circuit packs, only DS3 Ported/Unchan and EC1 ports may be used for the E Tributary and F Tributary.



NOTICE

Service-disruption hazard

Service interruptions can occur on tributaries if they are accidentally tested. Service interruptions may also occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested. Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the test access mode, test access rate, test access session number, and the addresses (AIDs) of the tributaries to be tested.

Steps

Complete the following steps to establish a new internal test access session in the SPLT(A or E) mode.

1 **Important!** Initially, an internal test access session *must* be established in the MONE test access mode and then changed from MONE to SPLTA or from MONE to SPLTE.

Establish the required internal test access session in the MONE test access mode.

Reference: Procedure 14-31: "Establish internal test access session in the MONE mode" (p. 14-150)

2 Change the test access mode of the internal test access session established in the previous step as required from:

- MONE to SPLTA
- MONE to SPLTE

Reference: Procedure 14-33: "Change test access mode of internal test access session" (p. 14-158)

3 If required at this time, assign a test signal generator/detector to the internal test access session.

Reference: Procedure 14-34: "Assign/remove test signal generator/detector to internal test access session" (p. 14-161)

END OF STEPS

Procedure 14-33: Change test access mode of internal test access session

Overview

Important! The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.

Use this procedure to change the test access mode of an existing internal test access session between MONE and SPLT(A or E).

To change the test access mode of an existing external test access session, refer to Procedure 14-25: “Change test access mode of external test access session” (p. 14-132).

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Restrictions

The following restrictions apply:

- A new internal test access session can be created only in the MONE test access mode initially.
- The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.
- The VLF circuit packs in the Main slots have 12 STS-1 signals routed to test signal generators and 12 STS-1 signals routed to test signal detectors. For STS-3 test access sessions, 3 STS-1 generators/detectors on the STS-3 boundary (1, 4, 7, 10) must be available.



NOTICE

Service-disruption hazard

Service interruptions can occur on tributaries if they are accidentally tested. Service interruptions may also occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested. Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the test access session number and the changes to be performed.

Steps

Complete the following steps to change the test access mode of an existing internal test access session.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **Modify an existing test access session's mode** and **Next**.

3 **Important!** The test access mode changes are limited between MONE and SPLT(A or E).

Follow the directions in the remaining *Test Access Wizard* screens to perform the required changes to the internal test access session.

4 **Important!** A test access session remains in effect until deleted.

Verify the test access session parameters, then click **Finish** at the end of the *Test Access Wizard* screens.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the *Test Access Wizard* appears.

5 Click **View existing test access sessions** and **Next**.

Result: A list of existing test access sessions appears.

6 Verify that the required test access session was changed and click **Close**.

END OF STEPS

Procedure 14-34: Assign/remove test signal generator/detector to internal test access session

Overview

Important! The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.

Use this procedure to perform the following changes to an existing internal test access session.

- Assign/remove a pseudo-random bit sequence (PRBS) test signal generator
- Assign/remove a pseudo-random bit sequence (PRBS) test signal detector.

To view test measurements for an existing internal test access session, refer to Procedure 14-35: “View test measurements for internal test access session” (p. 14-165).

To restart monitoring and initialize the counting bins to 0 for an existing internal test access session, refer to Procedure 14-36: “Initialize test measurements for internal test access session” (p. 14-167).

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Test Signal Generator parameter

A pseudo-random bit sequence (PRBS) test signal generator is assigned or removed from an internal test access session using the Test Signal Generator parameter.

When the Test Signal Generator parameter is provisioned PRS, a test signal generator is assigned and a pseudo-random bit sequence is transmitted. While a test signal generator may be assigned to a test access session in the MONE test access mode, the transmitted test signal cannot be monitored until the test access session is changed to the SPLT(A or E) test access mode. A request to assign a test signal generator is denied if the requested test signal generator (or generators) is not available. A test signal generator is assigned until it is removed or the test access session is deleted.

When the Test Signal Generator parameter is provisioned <NULL>, any test signal generators that were assigned are removed and AIS is inserted.

Test Signal Detector parameter

A pseudo-random bit sequence (PRBS) test signal detector is assigned or removed from an internal test access session using the Test Signal Detector parameter.

When the Test Signal Detector parameter is provisioned PRS, a test signal detector is assigned and the pseudo-random bit sequence is monitored. If the test signal is not detected within 2 seconds, the command is denied, and the detectors are freed. Once the test signal is detected, counting bins are initialized, and counting of errors on the test signal begins. The network element maintains a current 15-minute bin, up to 32 previous 15-minute bins, a current day bin, a previous day bin, and a total bin. A test signal detector is assigned until it is removed or the test access session is deleted.

When the Test Signal Detector parameter is provisioned <NULL>, any test signal detectors that were assigned are removed and no signal is monitored. Any counting bins associated with the session remain available until the test access session is deleted or monitoring is restarted.

Recommended external test head settings

The internal test head may not be compatible with some external test sets. The following settings are recommended for external test sets:

- For STS-1:
  - Mode = SDH
  - Payload = AU-3, Bulkfill
  - Pattern=2^{23}-1 PRBS, NORMAL
- For STS-3c:

  Same as STS-1, except for 3 STS-1 signals. This may require the test set to be set to background = foreground for the entire signal.

Restrictions

The following restrictions apply:

- A new internal test access session can be created only in the MONE test access mode initially.
- The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.
- The VLF circuit packs in the Main slots have 12 STS-1 signals routed to test signal generators and 12 STS-1 signals routed to test signal detectors. For STS-3 test access sessions, 3 STS-1 generators/detectors on the STS-3 boundary (1, 4, 7, 10) must be available.



NOTICE

Service-disruption hazard

Service interruptions can occur on tributaries if they are accidentally tested. Service interruptions may also occur on unintended tributaries if unsupported test access configurations are attempted.

Recheck the address (AID) of the tributary(ies) being tested. Do not attempt to establish unsupported test access sessions.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.
4. Verify that the work instructions identify the test access session number and the test signal changes to be provisioned.

Steps

Complete the following steps to assign/remove a test signal generator/detector to an existing internal test access session.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **Modify an existing test access session's mode** and **Next**.

3 Follow the directions in the remaining *Test Access Wizard* screens to assign/remove a test signal generator/detector to the internal test access session.

For more information about the Test Signal Generator and Test Signal Detector parameters, refer to "Test Signal Generator parameter" (p. 14-161) and "Test Signal Detector parameter" (p. 14-161).

4 **Important!** A test signal generator/detector is assigned until it is removed or the internal test access session is deleted.

Verify the Test Signal Generator and Test Signal Detector parameters, then click **Finish** at the end of the *Test Access Wizard* screens.

Result: A dialog box appears asking you to confirm executing this command. Click **Yes** and the *Test Access Wizard* appears.

5 Click **View existing test access sessions** and **Next**.

Result: A list of existing test access sessions appears.

6 Verify that the test signal generator/detector changes were made to the required internal test access session and click **Close**.

END OF STEPS

Procedure 14-35: View test measurements for internal test access session

Overview

Important! The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.

Use this procedure to view test measurements for an existing internal test access session.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

Steps

Complete the following steps to view test measurements for an existing internal test access session.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **View test measurement in a test access session** and **Next**.

Result: A list of internal test access sessions appears that have either test signal detectors assigned or counting bins available.

3 Select the required test access session and click **View Measurement**.

Result: The *Test Measurement Report* appears for the test access session.

If required, click **Reset** to restart monitoring and the initialize the counting bins to 0.

4 Click **Close** to exit.

END OF STEPS

Procedure 14-36: Initialize test measurements for internal test access session

Overview

Important! The network element must be equipped with Very Large Fabric (VLF) circuit packs in the Main slots to support internal test access sessions.

Use this procedure to initialize test measurements for an existing internal test access session.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".

Steps

Complete the following steps to initialize test measurements for an existing internal test access session.

1 From the System View menu select **Fault** → **Analysis** → **Test Access**.

Result: The *Test Access Wizard* appears.

2 Click **View test measurement in a test access session** and **Next**.

Result: A list of internal test access sessions appears that have either test signal detectors assigned or counting bins available.

3 Select the required test access session and click **View Measurement**.

Result: The *Test Measurement Report* appears for the test access session.

4 Click **Reset** to restart monitoring and the initialize the counting bins to 0.

5 Click **Close** to exit.

END OF STEPS

Procedure 14-37: Perform end-to-end optical line test on DWDM line

Overview

Use this procedure to verify the integrity of the following DWDM lines:

- OTS line
- OCH line
- OTU2 line

Important! This test must be performed locally at each Alcatel-Lucent 1665 DMX shelf location associated with the DWDM line being tested.

Privilege level

You must log in as either a Privileged, General, or Maintenance user to complete this procedure.

Before you begin

Prior to performing this procedure:

1. Refer to "Before you begin" (p. 14-3) and "Required equipment" (p. 14-3) in this chapter.
2. Refer to "Laser safety" (p. 1-6) and "Electrostatic discharge" (p. 1-26) in Chapter 1, "Safety".
3. Obtain the work instructions for this procedure.

Steps

Complete the following steps to verify the integrity of a DWDM line.

1

If testing...	Then select...
OTS line,	**Performance → View PM/Statistics Report → OTS Line**
OCH line,	**Performance → View PM/Statistics Report → OCH Line**
OTU2 line,	**Performance → View PM/Statistics Report → OTU2 Line**

Result: The *Line PM Report* window opens.

2 Expand the required circuit pack by clicking on the plus sign (+) next to the circuit pack. Select the required port and click **Select**.

Result: The performance monitoring parameters appear.

3 Provision the *Time Period* parameter **15 Min** and the *Number of Bins* parameter **All**. Then move all the *Available Parameters* to *Selected Parameters* by clicking **Select All**. Click **Apply** to obtain the *Line PM Report*.

Result: The *Line PM Report* appears. The parameters should be within acceptable ranges.

Reference: Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Applications and Planning Guide, 365-372-300*, for the acceptable parameter ranges.

4 Were the parameters within acceptable ranges?

If...	Then...
Yes,	Proceed to Step 6.
No,	Continue with Step 5.

5 Trouble may be in optical and/or fiber connections. Trouble may also be in the circuit packs. If report indicated trouble when the report was obtained from the near end of the span, trouble may be in the receive direction. If the report indicated trouble when the report was obtained from the far end of the span, trouble may be in the transmit direction. Check optical fiber and connections. Clean optical fiber connections.

Reference: Procedure 14-3: "Clean optical fibers, dual LC adapters and LC lightguide buildouts (LBOs)" (p. 14-38)

If no trouble was found in the optical fiber, click the **Alarm List** button to obtain the *NE Alarm List*. Refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302* to clear/isolate the trouble.

6 Have you retrieved error-free performance-monitoring reports from all shelf locations associated with the DWDM line being tested?

If...	Then...
Yes,	STOP! End of Procedure.
No,	Repeat this procedure at the other shelf locations.

END OF STEPS

Appendix A: Provisionable parameters

Overview

Purpose

This appendix identifies the provisionable parameters and the user settable values. The tables in this appendix include the TL1 commands and related *WaveStar*® CIT commands associated with each activity. For detailed information about TL1 commands refer to the *Alcatel-Lucent 1665 Data Multiplexer (DMX) TL1 Message Details, 365-372-306*.

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Port parameters

The following table shows the provisionable port parameters.

Table A-1 Port parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
BPV to All Zeroes Translation on Incoming DS1 (bpv) [1]	**ENT-T1** (P, G)	N,Y	N	**Configuration → Equipment**
DS1 Incoming Signal Format (fmt)		SF, ESF, ESFN, UF	ESF	
DS1 Line Code (linecde)[1]		AMI, B8ZS	AMI	
DS1 Line Buildout (lbo)[1]		20 (0-133 ft.), 40 (133-267 ft.), 60 (267-420 ft.), 80 (420-550 ft.), 100 (550-655 ft.)	20	
Interface Type (intftype)	**ED-EQPT** (P, G)	E1, DS1		
E1 Signal Format (fmt)	**ENT-E1** (P, G)	FAS, CRC4	CRC4	
DS3 AIS	**ENT-T3** (P, G)	Y, N	N	
DS3/EC1 Mode (eif) LNW19/19B and LNW20 only LNW16: Hardware Settable	**ENT-T3** **ENT-EC1** (P, G)	DS3, EC1	DS3	

Table A-1 Port parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Line Buildout (lbo)	**ENT-EC1** **ENT-T3** (P, G)	728A/B Cable: IN (0-225), OUT (225-450) 735A Cable: IN (0-112), OUT (112-225)	IN	**Configuration → Equipment**
DS3 Line Coding (linecde)	**ENT-T3** (P, G)	B3ZS, CCHAN[1]	B3ZS	
DS3 Frame Format (frame)		M13, CBIT, CCHAN[1]	M13	
P-bit Violation Removal (pbit)		ON, OFF	ON	
DS3 Incoming Signal Format (fmt)		PBIT, FMBIT, CPBIT	PBIT	
TCA Monitoring Mode (tcamd)	**ENT-E1** **ENT-T1** **ENT-T3** **ENT-EC1** **ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** **ENT-OCH** **ENT-OTS** **ENT-OTU2** (P, G)	ENABLE, DISABLE	ENABLE	**Performance → Prov PM Settings**
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	**Configuration → Equipment**

Table A-1 Port parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Primary State (pst)	**ENT-E1** **ENT-T1** **ENT-T3** **ENT-EC1** **ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** **ENT-OCH** **ENT-OTS** **ENT-OTU2** (P, G)	OOS (NMON) OOS-MA-AS (AUTO) IS (In Service)	AUTO	**Configuration → Equipment**
Signal Failure Threshold (sfthr)	**ENT-E1** **ENT-T1** **ENT-T3** **ENT-EC1** (P, G)	-3, -6, -7, -8 -3, -6, -7, -8 -4, -6 -3, -5, -6, -7, -8, -9	-3 -3 -6 -6	
	ENT-OC3 **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	-5, -6, -7, -8, -9	-6	
Signal Fail Threshold (sfail)	**ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	-3, -4, -5	-3	

Table A-1 Port parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
PJC Monitor Point (pjcmon)	**ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	N (number of STSn tributary), AUTO AUTO-NO-TCA	AUTO-NO-TCA	**Performance → Prov PM Settings**
Transmission Protection (application) (low-speed slots)	**ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	0x1S1 (non-VLF Mains), 0x1S2 (non-VLF Mains), 0x1 (VLF Mains), 1+1, 1+1_OPTM, 1+1_BIDIR, UPSR, 2F (OC-48 and OC-192 ports only)	1+1	**Configuration → Equipment**
Transmission Protection (application) (high-speed slots)	**ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	UPSR, 1+1, 1+1_OPTM, 1+1_BIDIR 2F (OC-48 and OC-192 ports only) 0x1 (VLF Mains only)	UPSR	
Transmission Protection (application) (LNW705 XM10G/8 circuit pack client ports only)	**ENT-OC3** **ENT-OC12** **ENT-OC48** (P, G)	0x1	0x1	
Wavelength Selection (wlsel)	**ENT-OC192** (P, G)	CH1, CH2, CH3, CH4	CH3	
SS Bits (ssbits) (circuit pack level)	**ED-EQPT** (P, G)	SS00, SS10	SS00	
Socket Maintenance State (mst)		Normal, Maintenance	Normal	
Expected DWDM Frequency (efreq)		NA 9200 to 9590 in increments of 10 Auto	NA	

Table A-1 Port parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Default Port Maintenance (portmntc_default)	**ENT-SYS** (P)	Allow, Inhibit	Allow	**Configuration → Equipment**
PDH port Equipment Fault Control (pdheqfltctl)		Enabled, Disabled	Disabled	
Transmit Section Trace Format (strcwfmt) Expected Receive Section Trace Format (strcfmt)	**ENT-EC1** **ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	EC-1: 1, 2 OC-3/12/48/192: 1, 2, 16, 64	2	
Transmit Section Trace Value - Hexadecimal (strcout) Expected Receive Section Trace Value - Hexadecimal (exprstrc)		characters 0-9 and A-F in a string up to twice the number specified by the format	Format 1=00 Format 16=89 Format 64=C8	
Transmit Section Trace Value - ASCII (strcouttxt) Expected Receive Section Trace Value - ASCII (exprstrctxt)	**ENT-EC1** **ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	Any characters except semicolon, double quote, and backslash. Format 1=1 character Format 16 =15 characters Format 64=63 characters	Null	**Configuration → Equipment**
Receive Section Trace Identifier Monitor (rstimmon)		Enable, Disable	Disable	
Receive Section Trace Identifier Mismatch Consequent Action (rstimca)		Enable, Disable	Disable	

Table A-1 Port parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Port Mode (pmd) (LNW20 only)	**ENT-T3** (P, G)	PORTED (Function slots only), PORTLESS (odd ports only with non-VLF Mains, all ports with VLF Mains)	PORTED (ports in Function slots), PORTLESS (Ports in Growth slots with VLF Mains) PORTLESS /UNAVAIL (Odd/even ports in Growth slots with non-VLF Mains)	**Configuration → Equipment**
Tributary Mode (tribmod) (LNW20 only)	**ENT-T3** (P, G)	UNCHAN, CHAN	UNCHAN (Function slots only), CHAN (Growth slots only)	**Configuration → Equipment**
Signal Type (signaltype)	**ENT-STNA** **ENT-OC3** **ENT-OC12** **ENT-OC48** (P, G)	STNA, OC3, OC12, OC48	STNA (No expected circuit pack type or unprotected companion), or Same value as protected companion	

Table A-1 Port parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Signal Type (signaltype) (LNW705 client ports only)	**ENT-OTPE** (P, G)	STNA, OC3, OC12, OC48, 1GE, FC100, FC200, FICON, FICON_EXP	STNA	**Configuration → Equipment**
Forward Error Correction Type (fectype)	**ENT-OTU2** (P, G)	EFEC: Enhanced FEC NOFEC: No FEC RSFEC: Industry-standard Reed-Solomon FEC	EFEC	
Transmit Fiber Type (tx_ftype)	**ENT-OTS** (P, G)	SSMF: not provisionable	SSMF	
Receive Fiber Type (rx_ftype)				
SS Bits (ssbits) (port level) (LNW55, LNW59, LNW62, LNW82, LNW504, and LNW603 only)	**ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	SS00, SS10	SS00	

[1] Does not apply to the TMUX circuit pack.

[2] Applies to the LNW523, LNW527, and LNW554 OC-192 OLIU circuit packs only.

Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).

Channel parameters

The following table shows the provisionable channel parameters.

Table A-2 Channel parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Primary State (pst)	**ENT-STS1** **ENT-STS3c** **ENT-STS12c** **ENT-STS48c** **ENT-STS192C** **ENT-VT1** **ENT-VC12** (P, G)	OOS-MA-AS (AUTO), OOS (NMON)	AUTO	**Configuration → Equipment**
	ENT-OCH (P, G)	OOS (NMON) OOS-MA-AS (AUTO) IS (In Service)	AUTO	
TCA Monitoring Mode (tcamd)	**ENT-STS1** **ENT-STS3c** **ENT-STS12c** **ENT-STS48c** **ENT-STS192C** **ENT-VT1** **ENT-VC12** **ENT-OCH** (P, G)	ENABLE, DISABLE	ENABLE	**Performance → Prov PM Settings**

Table A-2 Channel parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Signal Degrade Threshold (sfthr)	**ENT-STS1** **ENT-STS3c** **ENT-STS12c** **ENT-STS48c** **ENT-STS192C** (P, G)	-5, -6, -7, -8, -9 The STS-1 and STS-3c values must be the same.	-6	**Configuration → Equipment**
	ENT-VT1 (P, G)	-5, -6, -7, -8	-6	
Signal Fail Threshold (sfail)	**ENT-STS1** **ENT-STS3c** **ENT-STS12c** **ENT-STS48c** **ENT-STS192C** (P, G)	-3, -4, -5 The STS-1 and STS-3c values must be the same.	-3	**Configuration → Equipment**
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	
Default Tributary Maintenance (tribmntc_default)	**ENT-SYS** (P)	Allow, Inhibit	Allow	
Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).				

Ethernet parameters

The following table shows the provisionable Ethernet parameters.

Table A-3 Ethernet parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Port Type (porttype)	**ED-EPORT** (P, G)	Boundary, Interior	Boundary	**Configuration → Equipment**
Port Role (portrole)		Customer, Network	Customer	
Duplex Mode (dplxmd)		half, full, auto	auto	
Ethernet Port Monitoring Mode (epmode)		AUTO, NMON IS	AUTO	
Ethernet Port PM Enabled (eppm)	**ED-EPORT** (P, G)	Enable, Disable	Enable	**Performance → Prov PM Settings**
Flow Control Mode (fcmd)		Enable, Disable, auto, drop	auto	**Configuration → Equipment**
Line Rate (lnrate)		10m, 100m, auto LNW87: 10m, 100m, auto, GX, GT, FX, FT	auto LNW87: GX	
Default Port Tag (dftporttag)		1 - 4093 or 0	0	
Default Priority (dftpri)		NA, high, low	NA	
		LNW70/170: 0 - 3, NA	0	
		LNW78: 1 - 3	1	
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	**Configuration → Equipment**
Tag Filter (tagfilter)	**ED-EPORT** (P, G)	Enable, Disable	Enable	
Add Port Tag ID (addporttag)		1 - 4093 (Up to 55 Port Tag IDs in a single command)	None	
Delete Port Tag ID (delporttag)		1 - 4093	None	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Remote Client Fail (rcf)	**ED-EPORT** (P, G)	Enable, Disable	Disable	**Configuration → Equipment**
Remote Client Fail Link Shutdown (rcf_linkdown)		Enable, Disable	Enable	
Remote Client Fail Reverse Defect Indication (rcf_rdi) (LNW63, LNW64, LNW74, LNW87, and LNW70/LNW170 only)		Enable, Disable	Enable	
Link down hold-off Timer (rcf_ldhotmr)		0 to 10000 milliseconds (10 seconds), in 100 millisecond steps 99999 milliseconds (representing infinity)	200 milliseconds	
Far End Fault Indication Detection (fefi_det) (LNW74, LNW70/170, and LNW87 only)		LAN, LAN_RCF, RCF, Disable	Disable	
Far End Fault Indication Generation (fefi_gen) (LNW74, LNW70/170, and LNW87 only)		LAN, LAN_RCF, RCF, Disable	Disable	
Link Good (link_good) (LNW74, LNW70/170, and LNW87 only)		Enable, Disable	Disable	
Port Admin Control (admin)		Enable, Disable	Enable	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
TCA Monitoring Mode (tcamd)	**ED-EPORT** (P, G)	Enable, Disable	Disable	**Performance** → **Prov Settings**
Jumbo Frame Support (jumbo)		Enable, Disable	Enable	**Configuration** → **Equipment**
MTU (Maximum Transmission Unit) Size (mtu_size)		LNW63: 46 - 10222 LNW64: 46 - 10222 LNW70/170:46 - 10222 LNW74: 1500 - 9614 LNW78, LNW87, LNW705: 46 - 10222	1508	
Exceeded MTU size drop threshold (emsdt)		0 (feature disabled) to 1000 (100 per cent), in steps of 1 (0.1 per cent)	0	
Auto-Negotiation (autoneg)		Enable, Disable	Enable	
Crossover (mdix)		auto, mdix, mdi	auto	
Ethernet Type Field (ethertype)		0601 to FFFF (hexadecimal)	FFFF	
Network Port AF Queue Weighting Factor (qwt_ntwkAF)	**ED-EPORT** (P, G)	1 - 100	64	**Configuration** → **Equipment**
Customer Port AF Queue Weighting Factor (qwt_custAF)		1 - 100	36	
Total Queue Size (qsz)		For the LNW63 and LNW74: • NA • 128 (FE ports only) • 512 (GE ports only)	NA	
		For LNW70/170 and LNW78 with vlantagmd=switched 0 - 256.	256	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Yellow Packet Min Drop Threshold (qminthldy)	**ED-EPORT** (P, G)	0 - 100	33	**Configuration → Equipment**
Yellow Packet Max Drop Threshold (qmaxthldy)		0 - 100	50	
Green Packet Min Drop Threshold (qminthldg)		0 - 100	90	
CoS 0 Packets Drop Probability Mark (qdropwt0)		0 - 100	100	
CoS 1 Packets Drop Probability Mark (qdropwt1)	**ED-EPORT** (P, G)	0 - 100	100	**Configuration → Equipment**
CoS 2 Packets Drop Probability Mark (qdropwt2)		0 - 100	100	
CoS 3 Packets Drop Probability Mark (qdropwt3)		0 - 100	50	
Broadcast and Multicast Rate Limit (bcratelimit)		LNW70/170: 0 - 4000000 LNW78: 0 - 1000000	0	
Traffic Management Mode (trafmgmtmd)	**ED-EPORT** (P, G)	NOTC, PORT, TAGPORT, COSPORT, COSTAGPORT	PORT	**Configuration → Data → Provision QoS Service** **Configuration → Equipment**
Higher Layer Class of Service (hlayercos)		None, DSCP	None	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Spanning Tree Port Priority (stpp)	**ED-EPORT** (P, G)	0 - 255	128	**Configuration → Equipment**
Spanning Tree Path Cost (stpcost)		1 - 65535	65535	
Spanning Tree Hello Timer (sthellotm)		1 - 10 seconds	2	
Ethernet Port Spanning Tree Status (epss)		Enable, Disable	Enable	
Spanning Tree VLAN ID (stvid)	**ED-EPORT** (P, G)	0 - 4095	0	**Configuration → Equipment**
Ethernet Frame Check Sequence Mode (ethfcs)		Enable, Disable	Enable	
Locked Source Address (locked_sa)		Enable, Disable	Disable	
Actor Admin Port State LACP Activity (aapslact)		Active, Passive	Active	
Actor Admin Port State LACP Timeout (aapsltimo)		Long, Short	Long	
Actor Port Priority (actppri)		0 to 65535	32768	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Spanning Tree Group ID (stgrpid)	**ENT-STGRP** **ED-STGRP** (P, G)	1-4095	None	**Configuration** → **Data** → **Create Spanning Tree Group** **Configuration** → **Ethernet Service**
Virtual Switch ID (vrtswid)		1-4095 LNW70/170: 1-16	None	
Spanning Tree Root Priority (strp)		0 - 65535	32768	
Automatic Lock (autolock)		Enable, Disable	Disable	
Spanning Tree Max Age Timer (stmaxage)		6-255	255	
Spanning Tree forward delay timer (stfdtm)		4-255	15	
VCG AID List (vcglist)		An ampersand-separated list of VCG AIDs.	None	
Ethernet Port AID List (eplst)		An ampersand-separated list of Ethernet port and Link Aggregation Group (LAG) AIDs.	None	
Port Type (porttype)	**ED-VCG** (P, G)	Boundry, Interior	Interior	**Configuration** → **Data** → **Provision QoS Service** **Configuration** → **Equipment**
Port Role (portrole)		LNW70/170: Customer, Network LNW78: Customer	LNW70/170: Network LNW78: Customer	
Spanning tree port priority (stpp)		0-255	128	**Configuration** → **Equipment**
VCG Monitoring Mode (vmode)		auto, nmon	auto	
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VCG PM Enable (vpm)	**ED-VCG** (P, G)	Enable, Disable	Enable	**Performance → Prov PM Settings**
TCA Monitoring Mode (tcamd)		Enable, Disable	Disable	
Spanning Tree Path Cost (stpcost)		1 - 65535	10	**Configuration → Equipment**
Spanning Tree Hello Timer (sthellotm)		1 - 10 seconds	2	
Spanning Tree VLAN ID (stvid)		0 - 4095	4095	
VCG Spanning Tree Status (vss)		Enable, Disable	Enable	
Default Priority (dftpri)		LNW70/170: 0-3, NA LNW78: 1-3	LNW70/170: 0 LNW78: 1	**Configuration → Data → Provision QoS Service** **Configuration → Equipment**
Default Port Tag (dftporttag)		1-4093 or 0	0	**Configuration → Equipment**
Valid Port Tag Add List (addporttag)		Ampersand separated list (1-4093)	None	
Valid Port Tag Delete list (delporttag)		Ampersand separated list (1-4093)	None	
Pause control (psctl)		Transparent, Local, None	Local	
Tag Filter (tagfilter)		Enable, Disable	Enable	
MTU (Maximum Transmission Unit) Size (mtu_size)		46 - 10222	1508	
Exceeded MTU size drop threshold (emsdt)		0 (feature disabled) to 1000 (100 per cent), in steps of 1 (0.1 per cent)	0 (feature is disabled)	
Ethernet Type Field (ethertype)		0601 to FFFF (hexadecimal)	FFFF	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
GFP Frame Check Sequence (gpf_fcs)	**ED-VCG** (P, G)	Enable, Disable	Disable	**Configuration → Equipment**
LCAS Mode (lcasmd)		Enable, Disable	Enable	
Hold-Off Timer (htmr)		0 - 10000	200	
Wait-To-Restore (wtr)		0 - 3600	5	
Virtual Concatenation Mode (vcat)		Enable, Disable	Enable	
Network Port AF Queue Weighting Factor (qwt_ntwkAF)	**ED-VCG** (P, G)	1 - 100	64	**Configuration → Equipment**
Customer Port AF Queue Weighting Factor (qwt_custAF)		1 - 100	36	
Total Queue Size (qsz)		For LNW70/170 with vlantagmd=notag (private-line): • NA • 128 (FE ports only) • 512 (GE ports only)	NA	
		For LNW70/170 with vlantagmd=switched 0 - 256.	256	
Yellow Packet Min Drop Threshold (qminthldy)		0 - 100	33	
Yellow Packet Max Drop Threshold (qmaxthldy)		0 - 100	50	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Green Packet Min Drop Threshold (qminthldg)	**ED-VCG** (P, G)	0 - 100	90	**Configuration** → **Equipment**
CoS 0 Packets Drop Probability Mark (qdropwt0)		0 - 100	100	
CoS 1 Packets Drop Probability Mark (qdropwt1)		0 - 100	100	
CoS 2 Packets Drop Probability Mark (qdropwt2)		0 - 100	100	
CoS 3 Packets Drop Probability Mark (qdropwt3)		0 - 100	50	
Traffic Management Mode (trafmgmtmd)	**ED-VCG** (P, G)	LNW70/170: NOTC, PORT, TAGPORT, COSPORT, COSTAGPORT LNW78: PORT, COSPORT	LNW70/170: NOTC LNW78: PORT	**Configuration** → **Data** → **Provision QoS Service** **Configuration** → **Equipment**
Higher Layer Class of Service (hlayercos)		None, DSCP	None	
Broadcast and Multicast Rate Limit (bcratelimit)		0 - 1000000	0	**Configuration** → **Equipment**
Ethernet FCS Mode (ethfcs)		Enable, Disable	Enable	
Locked Source Address (locked_sa)		Enable, Disable	Disable	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Tagging Mode (vlantagmd)	**ED-EQPT** (P, G)	802.1TAG, TRANS, NOTAG, SWITCHED[2]	802.1TAG: LNW66 NOTAG: LNW70/170 SWITCHED: LNW78 NOTAG: LNW87, LNW705	**Configuration → Equipment** **Configuration → Ethernet Service**
Burst (brst)		1-255	5	**Configuration → Equipment**
Credit Interval (cint)		1-4095 (524.29 µsec-2.15 sec)	125 (65.5 msec)	
Ethernet Cross-Connect Mode (eccmode)		STS1, STS3C[3], STS12C	STS1	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VT Virtual Concatenation (vt_vcat)	**ED-EQPT** (P, G)	0, 12	0	**Configuration → Equipment**
Ethernet Port Mode (enetmd)		LNW63: GX, GT LNW64: GX, GT, GT_GX LNW70/170: GX_FX, GT_FX, FT_FX, GX_FT, GT_FT, FT LNW74: FT_FX, FX LNW78: GX_FX, GT_FX, GX_FT, GT_FT	LNW63 and LNW64: GX LNW70/170 and LNW78: GX_FX LNW74: FT_FX, (FT for growth slots)	
Slot Protection State (prot_state) (LNW170 only)		UNPROT, PROT	UNPROT	
Transmission Audit (LNW70/170 only)(taudit)		Enabled, Disabled	Enabled	
Far End Fault Indication Code (fefi_code)		2 digit hexadecimal number in the range 03 to FE	05	
MAC Address (mac)	**ENT-MAC** (P, G)	String of 12 hexadecimal characters	None	**Configuration → Data → Create MAC Address**
VLAN or Port Tag (tag)		1 - 4093	None	
Address Type (type)		Persistent, Filtered	None	
Ethernet LAN/VCG Port AID (portaid)		valid LAN Port, VCG, RPR VCG, EoS VCG, or Link Aggregation Group (LAG) AID required	None	
RPR MAC Address (rpr_mac)		LNW78: String of 12 hexadecimal characters	None	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Virtual Switch ID (vrtswid)	**ENT-VRTSW** (P, G)	1 - 4095 LNW70/170: 1-16 LNW78: 1-8	None	**Configuration** → **Data** → **Create Virtual Switch** **Configuration** → **Ethernet Service**
LAN port list (eplst)		Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	
VCG port list (vcglst)		Ampersand separated list of VCG, RPR IF VCG, and EoS VCG AIDs	None	
Virtual LAN Tagging Mode (tagmd)		802.1TAG, TRANS	802.1TAG	
Composite list of LAN ports to be added to virtual switch (addep)	**ED-VRTSW** (P, G)	Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	**Configuration** → **Data** → **Provision Virtual Switch**
Composite list of VCG ports to be added to virtual switch (addvcg)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	
Composite list of LAN ports to be deleted from virtual switch (delep)		Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	
Composite list of VCG ports to be deleted from virtual switch (delvcg)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VLAN ID (vlanid)	**ENT-VLAN** (P, G)	1- 4093 range	None	**Configuration** → **Data** → **Create VLAN** **Configuration** → **Ethernet Service**
Virtual Switch ID (vrtswid)		1 - 4095 LNW70/170: 1-16 LNW78: 1-8	None	
Ethernet/LAN port list (eplst)		Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	
VCG/WAN port list (vcglst)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	
Default Ethernet/LAN port list (dfeplst)		Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	
Default VCG/WAN port list (dfvcglst)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	
Composite list of LAN ports to be added to as VLAN members (addep)	**ED-VLAN** (P, G)	Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	**Configuration** → **Data** → **Provision VLAN**
Composite list of VCG ports to be added as VLAN members (addvcg)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	
Composite list of LAN ports to be added to as VLAN default ports (adddfep)		Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	
Composite list of VCG ports to be added as VLAN default ports (adddfvcg)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Composite list of LAN ports to be deleted as VLAN members (delep)	**ED-VLAN** (P, G)	Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	**Configuration** → **Data** → **Provision VLAN**
Composite list of VCG ports to be deleted as VLAN members (delvcg)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	
Composite list of LAN ports to be deleted as VLAN default ports (deldfep)		Ampersand separated list of port and Link Aggregation Group (LAG) AIDs	None	
Composite list of VCG ports to be deleted as VLAN default ports (deldfvcg)		Ampersand separated list of VCG, RPR IF VCG, EoS VCG AIDs	None	
Input Membership (source) (inmbs)	**ED-VCGTRIB** (P, G)	Disable, Enable	Disable	**Configuration** → **Equipment**
Output Membership (sink) (outmbs)		Disable, Enable	Disable	
Tag ID (tagid)	**ENT-ERATE** **ED-ERATE** (P, G)	1-4093	None	**Configuration** → **Data** → **Provision QoS Service**
Class of Service (cos)		0-3 LNW78: 1-3	None	
Committed Burst Size (cbs)		1-255	20	
Committed Information Rate (cir)		0 -10000	0	
Peak Burst Size (pbs)		1-255	30	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Peak Information Rate (pir)	**ENT-ERATE** **ED-ERATE** (P, G)	0-10000	10000	**Configuration** → **Data** → **Provision QoS Service**
QoS Performance Monitoring (qospm)		Enable, Disable	Enable	
Default Class of Service (dftpri2cos)		0-3	0	
User Priority Bit (userpri2cos)		String of 8 characters using 0 and 1	CoS 0: 01100000 CoS 1: 10010000 CoS 2: 00001100 CoS 3: 00000011	
Differentiated Services Code Point to CoS Level (dscp2cos)	**ENT-ERATE** **ED-ERATE** (P, G)	An ampersand-separated list of integers between 0 and 64. A dash (-) between 2 integers is allowed and represents a range. The value 64 is used to classify non-DSCP traffic to a CoS.	Defaults based on RFC2474, RFC2597, and RFC2598.[1]	**Configuration** → **Data** → **Provision QoS Service**

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Enhanced Bridging Mode (enh_brdgmd)	**ED-RPR** (P, G)	Enable, Disable	Enable	**Configuration → Equipment**
Attribute Discovery Timer (atd_tmr)		1-200 msec	20	
RPR Protection Wait-to-Restore (prot_wtr)		0-1440 seconds	0	
RPR Protection Fast Timer (prot_fasttmr)		1-20 msec	10	
RPR Protection Slow Timer (prot_slowtmr)		1-200 msec	20	
RPR Protection Holdoff Timer (prot_hotmr)		0-250 msec	0	
RPR Protection Keep Alive Timer (prot_katmr)		2-250 msec	3	
Primary Transit Queue Size (ptqsize)	**ED-RPR** (P, G)	2000-51200	5000	**Configuration → Equipment**
Secondary Transit Queue Size (stqsize)		2000 - 4194304	1800000	
Secondary Transit Queue Full Threshold (stqfullthr)		2000 - 4194304	1795000	
Topology Stability Timer (tstab_tmr)		10-100	40	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Fairness Ramp Coefficient (fair_ramp)	**ED-RPR** (P, G)	4-9	6	**Configuration** → **Equipment**
Fairness Low Pass Coefficient (fair_lp)		4-11	6	
Fairness Advertisement Ratio (fair_advert)		1-40	5	
Fairness STQ High Threshold (fair_stqhi)		0-1000	250	
Fairness STQ Low Threshold (fair_stqlo)		0-1000	500	
Fairness Maximum Add Rate (fair_maxrate)		0-1200	1200	
Fairness Aging Coefficient (fair_agec)		0-4	2	
Reserved Class A Add Rate (rsv_a)		0-1200 Mb/s	0	
Reserved Class B Add Rate (rsv_b)		0-1200 Mb/s	0	
VCG Monitoring Mode (vmode)	**ED-VCG-RPR** (P, G)	auto, nmon	auto	**Configuration** → **Equipment**
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VCG PM Enable (vpm)	**ED-VCG-RPR** (P, G)	Enable, Disable	Enable	**Performance → Prov PM Settings**
RPR IF Monitoring Mode (ifmode)		auto, nmon	auto	**Configuration → Equipment**
Valid Port Tag Add List (addporttag)		Ampersand separated list (1-4093)	None	
Valid Port Tag Delete list (delporttag)		Ampersand separated list (1-4093)	None	
Tag Filter (tagfilter)		Enable, Disable	Enable	
MTU (Maximum Transmission Unit) Size (mtu_size)		46 - 10222	1508	
Ethernet Type Field (ethertype)		0601 to FFFF (hexadecimal)	FFFF	
LCAS Mode (lcasmd)		Enable, Disable	Enable	
Hold-Off Timer (htmr)		0-10000 msec, 99,999 LNW78: 99,999	99,999	
Virtual Concatenation Mode (vcat)		Enable, Disable	Enable	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Total Queue Size (qsz)	**ED-VCG-RPR** (P, G)	For LNW78 with vlantagmd=switched 0 - 256.	256	**Configuration → Equipment**
Yellow Packet Min Drop Threshold (qminthldy)		0 - 100%	33	
Yellow Packet Max Drop Threshold (qmaxthldy)		0 - 100%	50	
Green Packet Min Drop Threshold (qminthldg)		0 - 100%	90	
CoS 1 Packets Drop Probability Mark (qdropwt1)		0 - 100%	100	
CoS 2 Packets Drop Probability Mark (qdropwt2)		0 - 100%	100	
CoS 3 Packets Drop Probability Mark (qdropwt3)		0 - 100%	50	

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Lead Port (leadport)	**ENT-LAGRP** (P, G)	Ethernet LAN port AID	None	**Configuration → Data → Provision LA Group**
Ethernet/LAN Port List (eplst)		Ethernet LAN port AID	None	
Add Ethernet/LAN port list (addep)	**ED-LAGRP** (P, G)	Ampersand separated list of Ethernet/LAN port AIDs	None	
Delete Ethernet/LAN port list (delep)		Ampersand separated list of Ethernet/LAN port AIDs	None	
Hash Type (hashtype)	**ENT-LAGRP** **ED-LAGRP** (P, G)	MAC, IP	MAC	
Protocol		LACP, NONE	LACP	
Active/standby mode (asmode)		Enable, Disable	Disable	
Actor System Priority (actsyspri)		0 to 65535	32768	
ERP port list (ERPport)	**ENT-ERP** (P, G)	An ampersand-separated list of 2 port AIDs.		**Configuration → Data → Create/Modify/Delete ERP**
RPL (Ring Protection Link) identification (protlink)		Ethernet port or VCG AID of one of the 2 ERP ports. A ring requires one (and only) one RPL.		

Table A-3 Ethernet parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VLAN identifier (vlan)	**ENT-ERP** **ED-ERP** (P, G)	1-4093		**Configuration** → **Data** → **Create/Modify/Delete ERP**
Wait-to-Restore timer (wtr)		1-12 minutes	5 minutes	
Guard timer (guard)		10-2000 milliseconds in steps of 10 milliseconds	500 milliseconds	
Maintenance Domain Level (mdlevel)		0-7	1	
Propagation of Topology Change (TC) messages (proptc)		Enable, Disable	Disable	
ERP instance state (state)		Enable, Disable	Enable	
R-APS PDU priority (pri)		0-7	7	

Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).

[1] The default values are:

- CoS 0: 0-9&11&13&15&26&28&30&34&36&38&44&50&52&54&58&60&62
- CoS 1: 16-25&27&29&31
- CoS 2: 10&12&14&32&33&35&37&39&40&43&45&47&64
- CoS 3: 46&48&49&51&53&55-57&59&61&63

[2] LNW70, LNW170, and LNW78 circuit packs only.

[3] LNW71 circuit packs only.

Data parameters

The following table shows the provisionable Data parameters.

Table A-4 Data parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Data Type (datatype)	**ED-EQPT** (P, G)	FC-FICON ESCON	FC-FICON	**Configuration** → **Equipment**
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	
Port Admin Control (admin)	**ED-DPORT** (P, G)	Enable, Disable	Enable	
Data Port Monitoring Mode (epmode)		AUTO, NMON IS	AUTO	
GFP Encapsulation Type (gfptype)		FC, FICON, ASYNC-FC (LNW73/73C only)	FC	
Line Rate (lnrate)		1G, 2G	1G	
Remote Client Fail (rcf)		Enable, Disable	Disable	
Remote Client Fail Link Shutdown (rcf_linkdown)		Enable, Disable	Enable	
TCA Monitoring Mode (tcamd)		Enable, Disable	Disable	**Performance** → **Prov PM Settings**
Data Port PM Enable (eppm)		Enable, Disable	Enable	
Synchronous Ping Enable (sync_ping)		Enable, Disable	Disable	**Configuration** → **Equipment**
Data Compression (compr)		Enable, Disable	Disable	

Table A-4 Data parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VCG Monitoring Mode (vmode)	**ED-VCG-Data** (P, G)	auto, nmon	auto	**Configuration** → **Equipment**
VCG PM (vpm)		Enable, Disable	Enable	**Performance** → **Prov PM Settings**
LCAS Mode (lcasmd)		Enable, Disable	Disable	**Configuration** → **Equipment**
Hold-Off Timer (htmr)		0 - 10000	200	
Wait-To-Restore (wtr)		0 - 3600	5	
Virtual Concatenation Mode (vcat)		Enable, Disable	Enable	
Input Membership (source) (inmbs)	**ED-VCGTRIB** (P, G)	Disable, Enable	Disable	**Configuration** → **Equipment**
Output Membership (sink) (outmbs)		Disable, Enable	Disable	
Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).				

Control plane parameters

The following table shows the provisionable control plane parameters.

Table A-5 Control plane parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Node ID (nodeid)	**ENT-NODE** (P)	0-255.0-255.0-255.0-255	0.0.0.0	**Configuration → Equipment**
Signaling Protocol Controller Identifier (spcid)		0-255.0-255.0-255.0-255	0.0.0.0	
Routing Controller (RC) ID (rcid)		0-255.0-255.0-255.0-255	0.0.0.0	
Routing Area ID (raid)		0-255.0-255.0-255.0-255	0.0.0.0	
SCN IP address (scnipaddr)		0-255.0-255.0-255.0-255	0.0.0.0	
Level 1 Routing Controller (l1routing)		Enabled, Disabled	Disabled	
Remote Routing Controller Identifier (remrcid)	**ENT-RC-NEIGHBOR** (P)	0-255.0-255.0-255.0-255	0.0.0.0	**Configuration → Equipment**
Remote Routing Controller SCN IP address (remrcscn)		0-255.0-255.0-255.0-255	0.0.0.0	
IP over line DCC (ip_linedcc)	**ENT-FECOM-SCN** (P)	Enabled, Disabled	Disabled	**Administration → Data Communications**
IP over LAN (ip_lan)		Enabled, Disabled	Disabled	
LAN IP Address (ipaddr_lan)		0-255.0-255.0-255.0-255	None	
LAN IP Subnet Mask (ipsnmk_lan)		0-255.0-255.0-255.0-255	None	

Table A-5 Control plane parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Destination IP address (dest_ip)	**ENT-ROUTE-SCN** (P)	0-255.0-255.0-255.0-255	None	**Administration → Data Communications**
Destination IP Subnet Mask (dest_mask)		0-255.0-255.0-255.0-255	None	
Outgoing Interface (outgoing_intf)		LAN or DCC AID	None	
Next Hop IP Address (nexthop_ip)		0-255.0-255.0-255.0-255	None	

Table A-5 Control plane parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Link Metric (linkmetric)	**ENT-CPORT-T3**	1- 65535	1	**Configuration → Equipment**
Logical Port Identifier (logportid)	**ENT-CPORT-EC1**	1 - 4294967295	1	
Port Class (portclass)	**ENT-CPORT-OC3**	Edge, ENNI, Traditional	Traditional	
Port Control (portcontrol)	**ENT-CPORT-OC12**	Normal, Lockout	Normal	
Remote Logical Port Identifier (remlogportid	**ENT-CPORT-OC48**	1 - 4294967295	1	
Remote Node Identifier (remnid)	**ENT-CPORT-OC192**	0-255.0-255.0-255.0-255	None	
Remote Routing Controller Identifier (remrcid)	**ENT-CPORT-VCG** (P, G)	0-255.0-255.0-255.0-255	None	
Remote Signaling Protocol Controller Identifier (remspcid)		0-255.0-255.0-255.0-255	None	
Remote Signaling Protocol Controller SCN Address (remspcscn)		0-255.0-255.0-255.0-255	None	
Remote Node Target Identifier (remtid)		TID of the downstream node that has the ENNI port	None	
Transport Network Assigned Address (tna)		Address assigned to endpoints of the connections by the transport service provider	None	
Transport Network Assigned Address Type (tnatype)		IPV4, IPV6, NSAP	None	

Table A-5 Control plane parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Call Identifier (callid)	**ENT-CONN** (P, G)	a fixed-length 12-byte (24-character) hexadecimal string	None	**Configuration → Create Control Plane Network Connections**
Protection Type (protype)		0x1, 1+1	None	
Service Level (servlevel)		0-255	None	
Direction (dir)		1way, 2way	None	
Bandwidth (bandwidth)		STS1, STS3C, STS12C, STS48C, STS192C	None	
Source/Destination Transport Network Assigned Address (TNA) Type (srctnatype and desttnatype)		IPV4, IPV6, NSAP	None	
Source/Destination Transport Network Assigned Address (TNA) (srctnaaddress and desttnaaddress)		an address assigned one endpoint of the connection by the transport service provider.	None	
Source/Destination Logical Port ID (srclogportid and destlogportid)		1 - 4294967295	None	
Source/Destination Label (srclabel and destlabel)		a timeslot (tributary) on the source/destination EDGE port	None	
Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).				

Cross-Connection parameters

The following table shows the provisionable cross-connection parameters.

Table A-6 Cross-Connection parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
VT1.5 Cross-Connect Type (cct)	**ENT-CRS-VT1** **ED-CRS-VT1** **ENT-ROLL-VT1** (P, G)	1way 1waypr	None	**Configuration → Cross-Connections** **Configuration → Ethernet Service**
STS-1 Cross-Connect Type (cct)	**ENT-CRS-STS1** **ED-CRS-STS1** **ENT-ROLL-STS1** (P, G)			
STS-3c Cross-Connect Type (cct)	**ENT-CRS-STS3c** **ED-CRS-STS3c** **ENT-ROLL-STS3c** (P, G)			
STS-12c Cross-Connect Type (cct)	**ENT-CRS-STS12c** **ED-CRS-STS12c** **ENT-ROLL-STS12c** (P, G)			
STS-48c Cross-Connect Type (cct)	**ENT-CRS-STS48c** **ED-CRS-STS48c** **ENT-ROLL-STS48c** (P, G)			
STS-192c Cross-Connect Type (cct)	**ENT-CRS-STS192c** **ED-CRS-STS192c** **ENT-ROLL-STS192c** (P, G)			
Location A (loca)*	**ENT-CRS-rr** **ED-CRS-rr** **ENT-ROLL-rr** (P, G)	Source Node TID	None	
Location Z (locz)*		Destination Node TID	None	
VT Location A (vtloca)*		VT Source Node TID	None	
VT-Accessed STS-1 (vtacc)		YES	None	

Table A-6 Cross-Connection parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Channel Application (chappl)	**ENT-CRS-rr** **ED-CRS-rr** **ENT-ROLL-rr** (P, G)	UNSWITCHED	None	**Configuration → Cross-Connections** **Configuration → Ethernet Service**
Circuit ID (circuitid)		up to 36 ASCII characters	None	
Cross-Connection Application (xcappl)		0-255	0	
Cross-Connection Number (xcnum)		Any 9-digit number	000000000	
Source Access Identifier (src_aid)	**ENT-CRS-OCH** (P, G)	Remote port, OC-192 port, OCH port, OTS port, OTU2	None	**Configuration → OCH Cross-Connections**
Destination Access Identifier (dest_aid)				

* In Release 3.1 and later releases, if automatic squelch map generation is enabled, Location A and Location Z are not required.

Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).

Synchronization parameters

The following table shows the provisionable synchronization parameters.

Table A-7 Synchronization parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
AIS Threshold Level (aisthres)	**SET-SYNCN** (P)	If SONET: LEVEL7, LEVEL6, LEVEL5, LEVEL4, LEVEL3, LEVEL2 If SDH: LEVEL4, LEVEL3, LEVEL2	SONET: LEVEL6 SDH: LEVEL4	**Configuration → Timing/Sync**
DS1 Input and Output Format for REF-1 (ds1_liof) and REF-2 (ds1_2iof)		SF, ESF	SF	
DS1 Input Line Code for REF-1 (ds1_1ilc) and REF-2 (ds2_lilc)		AMI, B8ZS	AMI	
DS1 Sync Output Equalization for REF-1 (ds1_1equ) and REF-2 (ds1_2equ)		1249C cable: 20 (90 ft.), 40 (180 ft.), 60 (270 ft.), 80 (360 ft.), 100 (450 ft.) 613C Cable: 20 (133 ft.), 40 (267 ft.), 60 (400 ft.), 80 (533 ft.), 100 (655 ft.)	20	
E1 Input and Output Format for REF-1 (e1_liof) and REF-2 (e1_2iof)		FAS, CRC4	CRC4	
External Timing Reference Input and Output Sa bit (ext_isa and ext_osa)		SA4, SA5, SA6, SA7, SA8	SA4	

Table A-7 Synchronization parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
External Timing Reference SSM Support (ext_issm)	**SET-SYNCN** (P)	Enabled, Disabled	Disabled	**Configuration → Timing/Sync**
Forced DUS (frcdus)		Enabled, Disabled	Disabled	
Mode Switch (mdsw)		REVERTIVE NONREVERTIVE	REVERTIVE	
Reference Switching Mode (refswmod)		Revertive-1, Revertive-2, Nonrevertive	Nonrevertive	
Synchronization Mode (syncnmod)		FRNG, EXT, EXT_SYNCOUT, LINE, LINE_SYNCOUT	EXT	
Synchronization Source (src)		Any OC-n line	None	
SynchAutorecon-figuration (auto)		Enabled, Disabled	Disabled	
System Synchronization Characteristic (synccrtc)		SONETSYNC, SDHSYNC	SONETSYNC	
Sync Messaging (syncmsg)	**ENT-OC3** **ENT-OC12** **ENT-OC48** **ENT-OC192** (P, G)	Sbyte, Disabled	Sbyte	**Configuration → Equipment**
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	
Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).				

Performance monitoring parameters

The following table shows the provisionable performance monitoring parameters.

Table A-8 Performance monitoring parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Monitored Type (montype)	**SET-TH-E1** **SET-TH-VC12** **SET-TH-T1** **SET-TH-T3** **SET-TH-VT1** **SET-TH-STS1** **SET-TH-STS3c** **SET-TH-STS12c** **SET-TH-STS48c** **SET-TH-STS192C** **SET-TH-EC1** **SET-TH-OC3** **SET-TH-OC12** **SET-TH-OC48** **SET-TH-OC192** **SET-TH-FE** **SET-TH-1GE** **SET-TH-DATA** **SET-TH-STP** **SET-TH-OCH** **SET-TH-OTS** **SET-TH-ODU2** **SET-TH-OTU2** (P, G, M)			**Performance → Prov Near-End PM Threshold** **Performance → Prov Far-End PM Threshold**
Threshold Level (thlev)				
Location (locn)		FEND[1], NEND	NEND	
Direction (dirn)		NULL, NA	NA	
Time period (tmper)		15-MIN, 1-DAY, NONE	NA	

Table A-8 Performance monitoring parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Format (fmt)	**SET-TH-T1** (P, G, M)	SF, ESF	ESF	**Performance → Prov Near-End PM Threshold**
	SET-TH-T3 (P, G, M)	PBIT, FMBIT, CPBIT	PBIT	**Performance → Prov Far-End PM Threshold**

Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).

[1] Far End (FEND) does not apply to Fast Ethernet, Gigabit Ethernet, and Data interfaces.

Operations parameters

The following table shows the provisionable operations parameters.

Table A-9 Operations parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Date	**ED-DAT** (P)	YY-MM-DD (00-01-01 — 99-12-31)	70-01-01	**Administration** → **Set Date and Time**
Time		HH-MM-SS (00-00-00 — 23-59-59)	00:00:00	
NE's DCC Side	**ENT-FECOM** (P)	NS (network side), US (user side)	(function of slot, dcc AID and protection mode)	**Configuration** → **DCC Terminations**
OSI Communication (com)		Enabled, Disabled	Enabled-front Disabled-rear	
LAN Reset		lan-1, lan-2	lan-1	**Administration** → **Reset IAO LAN**
IP Address of the System (ipaddr)	**ENT-ULS** (P)	32-bit IP address; 4 dot-separated decimal numbers from 0-255	169.254.1.1	**Administration** → **Data Communications**
IP Default Router Address (ipdrad)		32-bit IP address; 4 dot-separated decimal numbers from 0-255	None	
IP Subnet Mask for IAO LAN Ports (ipsnmk)		32-bit IP address; 4 dot-separated decimal numbers from 0-255	255.255.0.0	
TCP/IP communication over the specified IAO LAN port or DCC port (tcpip)		Enabled, Disabled	Enabled	**Administration** → **Data Communications** **Configuration** → **DCC Terminations**
Proxy ARP (proxyarp)		Enabled, Disabled	Disabled	**Administration** → **Data Communications**

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Alarm Gateway NE (agne)	**ENT-SYS** (P)	Yes, No	No	**Administration → Set NE**
Alarm Group Number (almgrp)		1-255	255	
Remote NE Status (rnestat)		Enabled, Disabled, Enable Far-End	Disabled	
FTAM-FTP Gateway (ftamftpgw)		Enabled, Disabled	Disabled	
File Transfer Protocol (ftp)		Enabled, Disabled	Enabled	
Security Log Overflow Message (slogthrshid)		0% to 90% (10% increments)	90%	
History Log Overflow Message (hlogthrshid)		0% to 90% (10% increments)	90%	
TL1 TCP/IP Gateway NE (tcpipgw)		Enabled, Disabled	Enabled	**Administration → Data Communications**
Target Identifier (TID)		20 alphanumeric or special characters: "-" (hyphen), "." (period)	LT-DMX	**Administration → Set TID**
Alarm Severity Assignment Profile (pfname)	**ENT-ASAP-ASGNMT** (P, G)	DEFAULT ASAP User-Created ASAP	DEFAULT ASAP	**Configuration → Equipment**

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Network Time Protocol (ntp)	**ENT-SYS** (P)	Enabled, Disabled, reset	Enabled	**Administration → Set Network Time Protocol**
Coordinated Universal Time Offset (utco)		-24:00 to +24:00 exclusive	0	
Network Element Mode (nemode)		normal, ring-upgrade	normal	**Configuration → Ring Upgrade Mode**
System Contact (syscontact)		Contact person for NE	None	**Administration → Data Communications**
System Location (syslocation)		Physical location of NE	None	
SNMP Authentication Trap (snmpauthtrap)		Enable, Disable	Enable	
Idle Channel Signal (Idle) (Insert AIS or Unequipped Signal)		ais, unequipped	ais	**Configuration → Equipment**
1+1 Protection Switch Priority (uniprotprio)		FRCD, SFPROT	FRCD	
Wait to Rename Timer (wtrename)		0 - 60 minutes	5 minutes	
Autolock Count (autolcnt)		0 to 20	0	
Autolock Switch Interval (autolswint)		1 to 1440	25	
Autolock Release Interval (autolrelint)		1 to 1440	1440	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Loopback Condition reporting (lpbkcond)	**ENT-SYS** (P)	Enabled, Disabled	Enabled	**Configuration → Equipment**
RADIUS Authentication (radius)		Enabled, Disabled	Disabled	
Automatic Ring Discovery (ard) (BLSR only)	**ED-PROTN-GRP** (P, G)	Enable, Disable	Enable	**Configuration → Equipment**
Wait-to-restore (wtr) (BLSR, 1+1, and 1+1_BIDIR)		0-12, 99 (BLSR) 0-12, (1+1 and 1+1_BIDIR)	5	
Ring Circuit Audit Enable (rcae) (BLSR only)		Enable, Disable	Enable	
Ring Circuit Alarm Mode (rcamode) (BLSR only)		Enable, Disable	Enable	
Ring Circuit Mode (rcmode) (BLSR only)		auto, Manual	auto	
Inconsistent VT BLSR Access Alarm Level (ivtbaalmlvl)		NA, NR	NA	
Revertive Mode Enable (rme) (1+1 and 1+1_BIDIR only)		Enable, Disable	Disable	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
NUT Attribute (nutatr)	**ED-PROTN-ACC** (P, G)	PROT, NOTPR, TNOTP	None	**Configuration → Equipment**
NUT Rate (nutrate)		STS1, STS3c, STS12c, STS48c, STS192c	STS1	
Timeslot (timeslot)		1 to 24 (for OC-48) 1 to 96 (for OC-192)	None	
New Target Identifier (newtid)	**ED-FETID** (P, G)	20 alphanumeric or special characters: "-" (hyphen), "." (period)	None	**Configuration → Change Far-End NE Name**
Target/Source Identifier (sid)	**SET-SID** (P)	20 alphanumeric or special characters: "-" (hyphen), "." (period)	None	**Administration → Set TID**
Local Node ID (localnid)	**ED-MAP-RING** (P, G)	0 - 15	None	**Configuration → Configure Manual Ring Map**
Ring Direction (ringdir)		W, E	E	
Ring Node ID List (rnids)		List with 16 entries (0- 15)	None	
Ring TID List (rtids)		List of valid TIDs	None	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Serial Port Baud Rate (baudrate)	**ENT-CID-SECU** (P, A, G, M, R)	1200, 2400, 4800, 9600, 19200	9600	**Administration → Data Communications**
Serial Port Echo (echo)		Enable, Disable	Enable	
OSI Level 2 Router (l3lv2is)	**ENT-ULSDCC-L3** (P)	Enable, Disable	Disable	
NSAP Address (l3org, l3res, l3rd, l3area)		L3ORG, L3RES, L3RD, L3AREA	L3ORG: 000000 L3RES: 0000 L3RD: 0000 L3AREA: 0000	
NSAP Threshold Level (nsapthlev)		0 to 250	0	
TARP Data Cache (l4etdc)	**ENT-ULSDCC-L4** (P)	Enable, Disable	Enable	
TARP Data Cache Manual Entries	**ENT-ULSDCC-L4** **DLT-ULSDCC-L4** (P)	Maximum number of 16 entries, with up to 15 entries that may be manually entered	None	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
TARP Lifetime (l4tlif)	**ENT-ULSDCC-L4** (P)	1 - 65535	100	**Administration → Data Communications**
TARP Loop Detection Buffer Flush Timer (l4lftm)		1 - 1440 minutes	5 minutes	
TARP Manual Adjacency	**ENT-ULSDCC-L4** **DLT-ULSDCC-L4** (P)		None	
TARP T1 Timer (l4t1tm)	**ENT-ULSDCC-L4** (P)	1 - 3600 seconds	15 seconds	
TARP T2 Timer (l4t2tm)		1 - 3600 seconds	25 seconds	
TARP T3 Timer (l4t3tm)		1 - 3600 seconds	40 seconds	
TARP T4 Timer (l4t4tm)		1 - 3600 seconds	20 seconds	
TCP/IP Calling Address (tcpipaddr)	**ENT-IPMAP** (P)	32-bit IP address of the OS; 4 dot-separated decimal numbers from 0-255	0	
ACID (Application Context ID) to be assigned to a TCP/IP address or IP Host		1-23 alphanumeric characters	TL1 PEERCOMM	
Host name assigned to a TCP/IP address (tcpiphost)		1-24 alphanumeric characters	None	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Application Context Identifier (acid)	**ENT-TL1MSGMAP** (P)	TL1PEERCOMM, TL1MAINTENANCE, TL1MEMORY-ADMINISTRATION, TL1TEST, TL1OTHER1, TL1OTHER2	None	**Administration → Set TL1 Message Map**
TL1 Autonomous Message Type (msgtype)		ALM (REPT ALM) ENV (REPT ALM ENV) CON (REPT COND) DB (REPT DBCHG) EVT (REPT EVT) PM (REPT PM) SW (REPT SW) CONNCHG(REPT CONNCHG) CONNEVT (REPT CONNEVT)	None	
Action		Enabled, Disabled	None	
LINEn (n=1 -11)	**ENT-BANNER** (P, A)	Max 11 lines (maximum of 60 characters per line) Total banner size cannot exceed 360 characters.	None	**Administration → Change NE Login Banner**
Application Context Identifier (acid)	**ENT-OSACMAP** **DLT-OSACMAP** (P)	TL1PEERCOMM, TL1MAINTENANCE, TL1MEMORY-ADMINISTRATION, TL1TEST, TL1OTHER1, TL1OTHER2, TL1CR	(function of VC and SPA)	**Administration → Data Communications**
TAP Learn Status (tlearnstat)	**ED-IP-TUNNEL** (P)	Enable, Disable	Disable	**Administration → Data Communications**
TAP Advertise Status (tadverstat)		Enable, Disable	Disable	
TAP Group Number (tapgroup)		0-65535	0	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Time Change Threshold (timechg)	**ED-NTP** (P)	1 to 499 msec	128 msec	**Administration → Set Network Time Protocol**
Minimum Poll Interval to NTP Server (minpinvl)		16-16384 seconds and values are powers of two	64 seconds	
Maximum Poll Interval to NTP Server (maxpinvl)		16-16384 seconds and values are powers of two	1024 seconds	
Maximum Adjustment Threshold (maxadj)		500 - 10000 msec	1000 msec	
IP Address of NTP server(s) (ipaddr)	**ENT-NTP-SERVER** **DLT-NTP-SERVER** (P)	32 bit IP address	None	
Destination IP address (dest_ip)	**ENT-IP-ROUTE** (P)	32-bit IP address; 4 dot-separated decimal numbers from 0-255	None	**Administration → Data Communications**
Destination IP subnet mask (dest_mask)		32-bit IP subnet mask; 4 dot-separated decimal numbers from 0-255	None	
Next-Hop Port Type (nxthopport)		lan,clnp_tunnel, DCC	clnp_tunnel	

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Next-Hop Address (nxthopadr)	**ENT-IP-ROUTE** (P)	IP address (for LAN) or NSAP address (for clnp_tunnel) Not required for DCC.	None	**Administration → Data Communications**
Tunnel Auto Provisioning (TAP) Advertise (tapadver)		Yes, No Not required for DCC.	Yes	
Tunnel Auto Provisioning (tap) Cost (tapcost)		0-65535 Not required for DCC.	20	
Profile Type (pftype)	**ENT-ASAP-PROF ED-ASAP-PROF INIT-ASAP-PROF** (P, G)	Bidirectional 1+1, Optimized 1+1, BLSR, DATA, DS1, DS3, E1, EC1, Circuit Pack, FELAN, GELAN, NVM, OCN, OCH, OTS, OTU2, Pluggable Transmission Module, STSN, Subshelf, System, System Timing, VC, VCG, VCGSTS, VCGVT, VT1.5	None	**Configuration → Alarms → Alarm Severity Assignment Profile**
Profile Name (pfname)		This is an alphanumeric character string (including the hyphen) with a maximum of 24 characters. The first character must be a letter. The characters are case insensitive.	DEFAULT	
Alarm Severity Levels[1]		Critical (CR), Major (MJ), Minor (MN), Not Alarmed (NA), Not Reported (NR)	-	
Command Mode (cmdmde)	**ENT-SUBSHELF** (P, G)	Main, Subshelf		**Configuration → Create Subshelf**
Subshelf number (subshelfnum)		2 – 14		

Table A-9 Operations parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
New Subshelf Number (newsubshelfnum)	**ED-SUBSHELF** (P, G)	2 – 14		**Configuration** → **Equipment**
Subshelf Type (subshelftype)	**ENT-SUBSHELF** **ED-SUBSHELF** (P, G)	DS1, DS3	DS1	**Configuration** → **Create Subshelf** **Configuration** → **Equipment**
Main Shelf Interface AID (mainintfc_aid)		1+1 Protection Group AID		
Main Shelf Target Identifier (main_tid)		TID of the main shelf in the multishelf DCS configuration		
Subshelf MAC Address (subshelfmac)		unique MAC address in system ID field within the network element OSI NSAP address		

Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).

[1] Refer to Alcatel-Lucent 1665 Data Multiplexer (DMX) Alarm Messages and Trouble Clearing Guide, 365-372-302 for detailed information about ASAPs and default alarm severity levels.

Security parameters

The following table shows the provisionable security parameters.

Table A-10 Security parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Password (pid)	**ENT-USER-SECU** **ED-USER-SECU** (P, A)	If the maximum password length is less than or equal to 10 characters, at least one alphabetic and at least three non-alphabetic characters. Of the three nonalphabetic characters, at least one must be a numeric character and at least one must be a symbolic character. The third non-alphabetic character can be either a numeric or a symbolic character. If the provisioned maximum password length is greater than 10 characters, the password must contain a mix of upper-case alphabetic characters, lower-case alphabetic characters, numeric characters, and special characters, including at least two of each type. The password must not contain the consecutive identical characters. The password msut not contain the user login.	None	**Administration** → **Security** → **Provision User Logins**

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
User Access Privilege (uap)	**ENT-USER-SECU** **ED-USER-SECU** (P, A)	Privileged, Administration, General, Maintenance, Reports-Only	None	**Administration → Security → Provision User Logins**
Password Aging Interval (page)		0 (Disabled), 7-999 days	0-default users 60-other users	
Inactivity Timeout Period (tmout)		0-999 minutes	30 minutes	
Allow Login (alw_login)	**ENT-USER-SECU** **ED-USER-SECU** (P, A)	Enabled, Disabled	Enabled	**Administration → Security → Provision User Logins** **Administration → Security → Enable User Login** **Administration → Security → Disable User Login**

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
New User ID (new_uid)	**ED-USER-SECU** (P, A)	case-sensitive alphanumeric string of 5-10 characters	None	**Administration → Security → Provision User Logins**
New Password (new_pid)		If the maximum password length is less than or equal to 10 characters, at least one alphabetic and at least three non-alphabetic characters. Of the three nonalphabetic characters, at least one must be a numeric character and at least one must be a symbolic character. The third non-alphabetic character can be either a numeric or a symbolic character. If the provisioned maximum password length is greater than 10 characters, the password must contain a mix of upper-case alphabetic characters, lower-case alphabetic characters, numeric characters, and special characters, including at least two of each type. The password must not contain the consecutive identical characters. The password msut not contain the user login.	None	
Lockout Status (lockout_status)		Enable Login	None	

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Old Private Identifier/ password (old_pid)	**ED-PID** (P, A, G, M, R)	If the maximum password length is less than or equal to 10 characters, at least one alphabetic and at least three non-alphabetic characters. Of the three nonalphabetic characters, at least one must be a numeric character and at least one must be a symbolic character. The third non-alphabetic character can be either a numeric or a symbolic character. If the provisioned maximum password length is greater than 10 characters, the password must contain a mix of upper-case alphabetic characters, lower-case alphabetic characters, numeric characters, and special characters, including at least two of each type. The password must not contain the consecutive identical characters. The password msut not contain the user login.	None	**Administration → Change Password**
New Private Identifier/ password (new_pid)				

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Security State (state)	**ENT-CID-SECU** (P)	IS (no lockout), LO (Lockout)	IS	**Administration → Security → Enable Lockout Security State** **Administration → Security → Disable Lockout Security State**
User ID Aging Period (usrage)	**ED-NE-SECU** (P, A)	0 - 999 Days	60	**Administration → Security → Provision NE Security**
Failed Login Attempts Lockout Period (intrvl)		0 - 99 Minutes	10	
Failed Login Attempts Lockout Threshold (thrshld)		2 - 99	5	
Failed Login Attempts Lockout Aging Period (age)		1 - 999 Minutes	60	
Minimum Waiting Period before Changing Password (pidwpd)		0 - 30 Days	20	
Change Password Status (chg_pwd_stat)		Enable, Disable	Disable	
Access Control List (ACL) Status (aclstat)		Enabled, Disabled	Disabled	
Minimum password length (pwmin)		6 – 18	6	
Maximum password length (pwmax)		10 – 20	10	
Recently used passwords (pwreuse)		5 – 15	5	

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Identifier for SNMPv1-2 user (uid)	**ENT-SNMP-USER** **ED-SNMP-USER** (P)	case-sensitive alphanumeric string of 6 to 15 characters	None	**Administration → Security → Provision SNMP v1-2 Users**
SNMPv1-2 User IP address (uipadr)		32-bit IP address	None	
SNMPv1-2 Request Functionality (reqfnct)		Enabled, Disabled	Enabled	
SNMPv1-2 Trap Functionality (trapfncts)		Enabled, Disabled	Enabled	
Identifier for SNMPv3 user (uid)	**ENT-SNMP-USER** **ED-SNMP-USER** (P)	case-sensitive alphanumeric string of 6 to 15 characters	None	**Administration → Security → Provision SNMP v3 Users**
SNMPv3 Tag identifier (tagid)		Case sensitive alphanumeric string	None	
SNMPv3 Authentication protocol (authprotocol)		NOAUTH, MD5, SHA	None	
SNMPv3 Privacy protocol (privprotocol)		NOPRIV, DES, 3DES, AES128, AES192, AES256	None	
SNMPv3 Authentication password (authpid)		Case sensitive alphanumeric string of 6-20 characters	None	
SNMPv3 Privacy password (privpid)		Case sensitive alphanumeric string of 6-20 characters.	None	

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Target transport IP address (tipadr)	**ENT-SNMP-ADDR** **ED-SNMP-ADDR** (P)	32-bit IP address consisting of four dot-separated decimal numbers 0-255	None	**Administration → Security → Provision SNMP Tables**
Tag Identifier List (tag_lst)		Quoted text string with tags separated by either a space character or a tab character	None	
Network type (domain)		UDP	None	
Expected maximum round trip time (timeout)		TBD	1500	
Number of retries (retrycnt)		0 – 255	3	
TargetParamsName (parm_id)		Case sensitive alphanumeric string of 6 to 20 characters.	None	
IP subnet mask (mask)		32-bit IP subnet mask consisting of 4 dot separated decimal numbers 0-255.	255.255.255.255	
Maximal message size (maxmsgsz)		484 – 65535	2048	

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Security model (sec_model)	**ENT-SNMP-GROUP** **ED-SNMP-GROUP** (P)	SNMPV1, SNMPV2C, USM	USM	**Administration** → **Security** → **Provision SNMP Tables**
Security level (sec_level)		NOAUTHNOPRIV, AUTHNOPRIV, AUTHPRIV	NOAUTH NOPRIV	
Read access MIB groups (readmibs)		Case sensitive alphanumeric string of maximal 6-20 characters.	None	
Write access MIB groups (writemibs)		Case sensitive alphanumeric string of maximal 6-20 characters.	None	
Notification MIB groups		Case sensitive alphanumeric string of maximal 6-20 characters.	None	
Context match value (match)		Exact, Prefix	Exact	
OID bit mask (mask)	**ENT-SNMP-MIBGP** **ED-SNMP-MIBGP** (P)	quoted Octet- String of up to 16 characters represented as a sequence of hexadecimal numbers separated by colons. Each octet is within the range 0x00 through 0xff.	None	**Administration** → **Security** → **Provision SNMP Tables**
MIB view type (type)		Include, Exclude	None	
Tag value (tag_id)	**ENT-SNMP-NOTIF** **ED-SNMP-NOTIF** (P)	Case sensitive alphanumeric string of 6 to 20 characters,	None	**Administration** → **Security** → **Provision SNMP Tables**
Notification type (notify_type)		Trap, Inform	Trap	

Table A-10 Security parameters (continued)

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Security model (sec_model	**ENT-SNMP-PARAM** **ED-SNMP-PARAM** (P)	SNMPV1, SNMPV2C, USM	USM	**Administration → Security → Provision SNMP Tables**
Security Name (sec_uid)		Case-sensitive alphanumeric string of 6 to 20 characters.	None	
Security level (sec_level)		NOAUTHNOPRIV, AUTHNOPRIV, AUTHPRIV	AUTHNOPRIV	
Access Table ID (groupid)	**ENT-SNMP-USERGP** **ED-SNMP-USERGP** (P)	Case sensitive alphanumeric string of 6 to 20 characters or NULL.	None	**Administration → Security → Provision SNMP Tables**
ACL target identifier (acl_tid)	**ENT-ACL** (P, A)	Target Identifier of the ACL entry	None	**Administration → Security → Provision Access Control**
ACL NSAP (acl_nsap)		NSAP of the ACL entry.	None	
RADIUS Server IP Address (ipaddr)	**ENT-RADIUS-SERVER** (P, A)	Four dot-separated decimal numbers ranging from 0 to 255. The value 0.0.0.0 is invalid	None	**Administration → Security → Provision Radius Server**
UDP port number for RADIUS (port)		1 to 65535	1812	
Role of RADIUS Server (role)		Primary, Secondary	None	
Secret		Valid values are case-sensitive strings of 1 to 128 characters, with characters @ , : = “ ; * \ ! ? not being allowed due to their special TL1 meanings.	None	
Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).				

Miscellaneous parameters

The following table shows miscellaneous provisionable parameters.

Table A-11 Miscellaneous parameters

Parameter	TL1 Commands (Access) (Note)	Range	Default	Related *WaveStar*® CIT Commands
Alarm Clear Delay (clrdel)	**SET-ATTR-ALM** (P, G)	0-30 sec.	10	**Configuration** → **Alarms** → **Alarm Configuration**
Incoming Signal Alarm Delay (almdel)		0-30 sec.	2	
Miscellaneous Discrete Alarm Notification Code (ntfcncde)	**SET-ATTR-ENV** (P, G)	CR, MJ, MN, NA	1-14: MN 15: MJ 16-19: MN	**Configuration** → **Misc. Discretes**
Miscellaneous Discrete Alarm Type (almtype)		1-10 alphanumeric characters	1-14: MISC 15: not provisionable 16-19: MISC	
Miscellaneous Discrete Alarm Message (almmsg)		Up to 26 alphanumeric and symbolic characters (case-sensitive)	1-14: environment 15: not provisionable 16-19: environment	
Miscellaneous Discrete Control Type (conttype)	**SET-ATTR-CONT** (P, G)	Up to 26 alphanumeric and symbolic characters (case-sensitive)	control (1-4)	
Note: The TL1 command security access levels are Privileged (P), Administration (A), General (G), Maintenance (M), and Reports-only (R).				

Appendix B: Circuit pack availability

Overview

Purpose

This appendix lists the circuit packs that are available in Alcatel-Lucent 1665 DMX, Release 9.1. In addition, circuit packs that have been declared Discontinued Availability (DA) prior to the GA of Release 9.1 and those that are planned to be DA'd shortly after the GA of Release 9.1. Although DA'd circuit packs are no longer orderable as of the DA date, they may still be in existing Network Elements.

Contents

Circuit pack availability in Release 9.1	B-2

Circuit pack availability in Release 9.1

The following table lists all the available and DA'd Alcatel-Lucent 1665 DMX circuit packs as of Release 9.1.

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW1	108695586	SYSCTL – System Controller	R1.0	R1.0	8/2009	LNW2
LNW2	108994989	SYSCTL – Enhanced System Controller	R6.0	R4.0		
LNW6	108694837	28 DS1	R1.0	R1.0	11/2006	LNW8
LNW7	108764036	28xDS1 PM	R1.0	R1.0		
LNW8	109164889	56xDS1/E1 PM	R3.1	R1.1		
LNW16	108694845	12xDS3/EC-1	R1.1	R1.0		
LNW18	109164905	Transmux (12 ports)	R3.0	R1.1		
LNW19	109187567	48xDS3/EC-1	R3.1	R2.0	8/2007	LNW19B
LNW19B	109492470	48xDS3/EC-1 with terminal loopbacks	R5.0	R3.0		
LNW20	109535070	48 port portless/ported DS3 transmux/EC-1	R7.0.1	R5.0.1		
LNW26	108694852	1 OC-48 HS, LR port per pack with VT granularity of 6 STS-1s	R1.0		5/2002	LNW27
LNW26B	109152058	1 OC-48 HS, LR port per pack with VT granularity of 12 STS-1s	R2.0		3/2008	LNW27

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW27	108923525	1 OC-48 HS, LR port per pack with VT granularity of 48 STS-1s	R2.1			
LNW28	108923533	1 OC-48 HS, LR (50 km) port per pack, OSP hardened with VT granularity of 12 STS-1s	R2.0		5/2006	LNW32
LNW29	108923541	1 OC-48 HS, Extended LR (1550 nm) ports per pack with VT granularity of 48 STS-1s	R2.1			
LNW31	109008987	1 OC-48 LS, IR port per pack with VT granularity of 12 STS-1s	R2.0	R3.0		
LNW32	109008995	1 OC-48 HS, LR port per pack OSP hardened with VT granularity of 48 STS-1s	R4.0		10/2012	LNW202 with PTMs
LNW36	108694860	4 OC-3 LS, LR ports per circuit pack, OSP hardened with VT granularity of 12 STS-1s	R1.0	R1.0	12/2007	LNW37

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW37	109068783	4 OC-3 LS, SFP ports per circuit pack with VT granularity of 12 STS-1s supporting facility loopbacks	R4.0	R2.0		
LNW38	109196352	1 OC-12 HS, IR port per pack, OSP hardened with VT granularity of 12 STS-1s		R1.0		
LNW39	109296360	16 DS1 ports and 3 DS3 ports per pack		R1.0		
LNW40	109197111	1 OC-3 HS, IR port per pack, OSP hardened with VT granularity of 6 STS-1s		R1.0		
LNW41	109197129	1 OC-48 HS, PTM per pack, OSP hardened with VT granularity of 48 STS-1s		R3.1		
LNW45	109411082	8 OC-3 LS, PTM ports per pack, , OSP hardened with 48 STS-1 VT fabric	R5.0	R3.0		

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW46	108694878	2 OC-12 LS, LR ports per circuit pack, OSP hardened with VT granularity of 12 STS-1s	R1.1	R1.1	12/2007	LNW49
LNW48	109187575	1 OC-12 HS, IR port per pack, OSP hardened with VT granularity of 12 STS-1s	R3.1			
LNW49	109319582	4 OC-12 LS, PTM ports per pack, , OSP hardened with VT granularity of 48 STS-1s	R4.0	R3.0		
LNW50	109319590	1 OC-12 HS, LR port per pack, OSP hardened with VT granularity of 12 STS-1s	R3.1			
LNW51	109423269	1 OC-12 HS, LR port per pack, OSP Hardened with VT granularity of 12 STS-1s		R1.1		
LNW52	109492488	1 OC-48 HS, port per pack, OSP hardened with VT granularity of 12 STS-1s (upgrade pack)		R4.0		

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW54	109506055	1 OC-12 HS, LR 1550 nm port per pack, , OSP hardened with VT granularity of 12 STS-1s	R5.1		10/2012	LNW203 with PTMs
LNW55	109532283	12 port, OC-3/OC-12/OC-48 Multi-rate LS, 10G capacity, PTMs, OSP hardened	R7.1	R5.1		
LNW56	108848052	1 OC-192 HS, IR (1550 nm, 40 km) ports per pack with VT granularity of 48 STS-1s	R2.1.2			
LNW57	109126391	1 OC-192 HS, LR port per pack with VT granularity of 48 STS-1s – equipped with Tone circuitry	R4.0		9/2011	LNW502 with PTMs (no tone circuitry)
LNW58	109164939	1 OC-192 HS, Short Reach port per pack (based on the LNW56) with VT granularity of 48 STS-1s	R2.1.2			

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW59	109494799	2 OC-192 HS, XFP ports per pack with VT granularity of 192 STS-1s	R7.0			
LNW60	109522821	1 OC192 HS, LR port per pack with VT granularity of 48 STS-1s – equipped with optical amplifier	R5.1		3/2011	
LNW62	109532291	4 OC-48 LS, PTM ports per pack, OSP hardened	R7.0	R5.0		
LNW63	109535088	4 ports, 1000BASE-SX/LX/ZX, optical, GbE private line, PTM ports per pack – maximum throughput of 2.5 Gb/s, protected SONET connections only, OSP hardened	R6.0	R4.0		
LNW64	109599696	8 Ethernet LAN, GbE Private Line, PTM ports per pack. OSP hardened	R7.0	R5.0		

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW66	108848078	24 10BASE-T electrical ports and 2 GbE WAN ports per pack	R1.1	R1.1	10/2012	LNW170
LNW67	108848086	2 ports 1000BASE-SX – optical, GbE LAN, SR (850nm, multimode, 500m) ports and 2 GbE WAN ports per circuit pack	R1.1	R1.1	3/2008	LNW170
LNW68	108869660	2 ports 1000BASE-LX optical, GbE LAN, LR (1310nm, single mode, 10km) ports and 2 GbE WAN ports per pack	R1.1	R1.1	3/2008	LNW170
LNW70	108869660	8 Ethernet LAN PTMs, (4 1000BASE-SX/LX/LX10 and 4 100BASE-FX), per pack 32 VCGs	R5.1	R3.1	1/2010	LNW170

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW71	108869660	24 10BASE-T/100BASE-TX, electrical ports and 24 100Mbps WAN ports per pack	R3.1	R1.0	3/2008	LNW74
LNW73	109461491	SAN Private Line transport (Fibre Channel/FICON/ESCON) over SONET, and 4 client-side ports using PTM optics	R5.1	R3.1		
LNW73C	109575605	SAN Private Line transport (Fibre Channel/FICON/ ESCON) over SONET, and 4 client-side ports using PTM optics with Data Compression capabilities	R7.0	R5.0	2/2012	LNW73
LNW74	109492504	8 100BASE-FX LAN ports w/SFP optics and 16 10BASE-T/100Base-TX LAN ports and 24 100 Mb/s WAN ports OSP hardened	R5.0	R3.0		

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW76	109164947	1 OC-48 HS, SR port per pack with VT granularity of 48 STS-1s	R2.1			
LNW77	109167627	1 OC-48 HS, IR (1310 nm) port per pack with 12 STS-1 VT fabric	R2.0		2/2007	LNW27
LNW78	109167635	Switched Ethernet pack for RPR application, 8 SFP ports (6 usable-2GbE/4FE) per pack	R6.0.1	R4.0.1	1/2010	
LNW80	109461509	Main Switch Pack, HS Main without optics	R4.0			
LNW82	109643932	8-port, OC-3/12, 2x48 Multi-rate HS, VLF main, 5G capacity, PTM optics, OSP hardened	R7.1			
LNW84	109643940	8-port, OC-3/12/48, 2x48, 16 DS1, 3 DS3, Multi-rate HS, VLF main, 5G capacity, PTM optics, OSP hardened		R8.0		
LNW87	109709188	4-port FE/GigE Private line, OSP	R9.0	R9.0		

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW111	109310839	3 DS3 ports per pack		R2.0		
LNW112	109310821	16 DS1 ports per circuit pack		R2.0		
LNW121	109150946	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW121B	109184788	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		3/2005	LNW202
LNW123	109150961	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW123B	109184796	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW125	109150987	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW125B	109184804	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		9/2007	LNW202
LNW127	109151001	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW127B	109184812	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		9/2007	LNW202
LNW131	109151027	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW131B	109184820	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW133	109151043	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW133B	109184838	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW135	109151068	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW135B	109184846	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW137	109151084	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW137B	109184853	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW140	109567131	1 OC-3 HS and 16 DS1s per pack (full width pack)		R5.0	10/2012	LNW40 and the LNW112

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW141	109567149	1 OC192 HS, XFP per pack, OSP hardened with VT granularity of 192 STS-1s		R5.0		
LNW143	109151118	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW143B	109184861	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW145	109151134	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW145B	109184879	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW147	109151159	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW147B	109184887	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		11/2004	LNW202
LNW149	109151175	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW149B	109184895	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		3/2005	LNW202
LNW153	109151191	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW153B	109184903	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		9/2007	LNW202
LNW155	109151217	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW155B	109184911	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		9/2007	LNW202
LNW157	109151233	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW157B	109184929	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		3/2005	LNW202
LNW159	109151258	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		4/2002	LNW202
LNW159B	109184937	1 OC-48 HS, PWDM (16 lambdas) port per pack with VT granularity of 6 STS-1s	R2.0		3/2005	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW170	109642728	8 Ethernet LAN PTMs, (4 1000BASE-SX/LX/LX10 and 4 100BASE-FX), per pack 32 VCGs, mate LAG support	R7.1	R5.1		
LNW202	109589135	OC-48 HS, with PTM optics	R7.1			
LNW203	109702555	OC-12 HS SFP OSP with 12 STS-1 VT fabric	R9.0			
LNW221	109171355	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2005	LNW202
LNW223	109171363	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW225	109171371	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		12/2008	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW227	109171389	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW231	109171397	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW233	109171405	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		12/2008	LNW202
LNW235	109171413	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW237	109171421	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		12/2008	LNW202
LNW243	109171439	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2005	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW245	109171447	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW247	109171454	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW249	109171462	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW253	109171470	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW255	109171488	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW257	109171496	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2005	LNW202

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW259	109171504	1 OC-48 HS, DWDM (32 lambdas) ports per pack with VT granularity of 48 STS-1s	R2.1		3/2009	LNW202
LNW302	109706416	OC-3 HS, PTM-based, OSP Hardened with VT granularity of 6 STS-1s		R9.0		
LNW380	109610527	1 OC-12 HS, LR 1550 nm (LR2) port per pack, OSP Hardened with VT granularity of 12 STS-1s		R5.0	10/2012	LNW382 with PTMs
LNW382	109706408	OC-12 HS, PTM-based, OSP Hardened with VT granularity of 12 STS-1s		R9.0		
LNW391	109664508	16 DS1 ports and 3 DS3 ports per pack		R8.0		
LNW402	109678870	OC-48 LS, with PTM optics	R8.0	R8.0		
LNW421	109185116	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	3/2005	LNW402

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW423	109185124	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW425	109185132	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	5/2009	LNW402
LNW427	109185140	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	5/2009	LNW402
LNW431	109185157	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW433	109185165	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW435	109185173	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW437	109185181	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW443	109185199	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW445	109185207	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW447	109185215	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	5/2009	LNW402
LNW449	109185223	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	5/2009	LNW402
LNW453	109185231	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	5/2009	LNW402

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW455	109185249	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	11/2009	LNW402
LNW457	109185256	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	6/2004	LNW402
LNW459	109185264	1 OC-48 LS, PWDM (32 lambdas) port per pack with VT granularity of 12 STS-1s	R3.0	R3.0	5/2009	LNW402
LNW502	109589127	OC-192 mains w/XFP optics	R7.1			
LNW504	109709014	4xOC192 XFP + 4xOC-48 SFP HS VLF main, with a 40G VT Enhanced Fabric	R9.0			
LNW523	109207225	1 OC-192 HS, WDM (4 lambdas tunable) per pack port per pack with VT granularity of 48 STS-1s	R4.0		6/2007	LNW502

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW527	109207266	1 OC-192 HS, WDM (4 lambdas tunable) per pack port per pack with VT granularity of 48 STS-1s	R4.0		9/2009	LNW502
LNW554	109207530	1 OC-192 HS, WDM (4 lambdas tunable) per pack port per pack with VT granularity of 48 STS-1s	R4.0		2/2007	LNW502
LNW555	109207548	1 OC-192 HS, WDM Long Reach (80 km) port per pack with VT granularity of 48 STS1s	R3.1		2/2007	
LNW601	109589242	1 OC-3, HS, 1310 nm, long-reach, OSP hardened with VT granularity of 6 STS-1s		R4.0		
LNW603	109680496	One port OC-192 PTM-based (XFP) tributary pack	R9.0			

Table B-1 Alcatel-Lucent 1665 DMX circuit packs as of January 2011 (continued)

Apparatus Code	Comcode	Description	Release available		DA date	Suggested replacement
			DMX	DMXtend		
LNW705	109589242	10G DWDM Muxponder pack (XM10G/8) – PTM-based (8 SFPs + 1 XFP) 1GbE/GFP-F/VCAT into OC-192 (OTU2 w/Enhanced FEC); SAN (1G, 2G, FC/Ficon) and SONET (OC-3/12/48) clients	R7.1.1	R9.0		
LNW785	109616565	8-channel low-loss DWDM Mux/Demux (OMD5/8), with integrated VOAs, hw-ready for OSC	R7.1	R5.1		
LNW801	109664490	56xDS1/E1 PM	R8.0	R8.0		

Notes:

1. HS: High-Speed; installed in the Main slots
2. LS: Low-Speed; installed in the Function Groups or Growth slots
3. OSP: Outside Plant hardened
4. LR: Long Reach
5. IR: Intermediate Reach
6. SR: Short Reach
7. PTM: Pluggable Transmission Module, also referred to as a small form-factor plug-in (SFP)

Glossary

Type of diagnostic test used to compare an original transmitted signal with the resulting received signal. A loopback is established when the received optical or electrical external transmission signal is sent from a port or tributary input directly back toward the output.

Symbols

µ

Microns

µm

Micrometer

Numerics

1+1 (bidirectional)

The bidirectional 1+1 protection switching architecture protects against failures of the optical transmit/receive equipment and their connecting fiber facility. One bidirectional interface (two fibers plus associated OLIUs on each end) is designated "service," and the other is designated "protection." In each direction, identical signals are transmitted on the service and protection lines ("dual-fed"). The receiving equipment monitors the incoming service and protection lines independently and selects traffic from one line (the "active" line) based on performance criteria and technician/OS control. In bidirectional 1+1 switching, the network elements are not independent. When a protection switch is requested at a network element, both network elements perform protection switching.

1+1 (unidirectional)

The unidirectional 1+1 protection switching architecture protects against failures of the optical transmit/receive equipment and their connecting fiber facility. One bidirectional interface (two fibers plus associated OLIUs on each end) is designated "service," and the other is designated "protection." In each direction, identical signals are transmitted on the service and protection lines ("dual-fed"). The receiving equipment monitors the incoming service and protection lines independently and selects traffic from one line (the "active" line) based on performance criteria and technician/OS control. In unidirectional 1+1 switching, both service and protection lines could be active at the same time (service in one direction, protection in the other).

1GE

Gigabit Ethernet - 1.250 Gbps line rate.

1xN, 1x1

1xN protection switching pertains to circuit pack protection that provides a redundant signal path through Alcatel-Lucent 1665 DMX (it does not cover protection switching of an optical facility; see "1+1"). In 1xN switching, a group of N service circuit packs share a single spare protection circuit pack. 1x1 is a special case of 1xN, with N=1. In 1x1, only one is active at a time.

802.1Q Mode

In 802.1Q Mode, a circuit pack can be provisioned to use an incoming frame's VLAN tag either to add a VLAN tag associated with the port for untagged frames or to drop an incoming frame if its VLAN tagging does not meet provisioned specifications. The priority bits in an incoming frame's VLAN tag can also be used to affect the handling of the frame.

A

ABN

Abnormal (status condition)

AC

Alternating Current

ACIDs

Application Context IDs

Active

Active identifies any protected entity which is currently selected by the receiver at either end as the payload carrying signal that is currently carrying service (see Standby).

Adaptive Rate

See Pipe Mode.

Add/Drop Multiplexer (ADM)

The term for a synchronous network element capable of combining signals of different rates and having those signals added to or dropped from the stream.

ADM

Add/drop multiplexer

ADR

Add/drop ring

Aging

The filtering database entries are automatically removed after an aging period (300 seconds).

AGNE

Alarm gateway network element

AIS

Alarm indication signal

Alarm

Visible or audible signal indicating that an equipment failure or significant event/condition has occurred.

Alarm Cut-Off (ACO)

A button on the SYSCTL used to silence audible alarms.

Alarm Gateway Network Element (AGNE)

A defined network element in an alarm group through which members of the alarm group exchange information.

Alarm Indication Signal (AIS)

A code transmitted downstream in a digital network that shows that an upstream failure has been detected and alarmed.

Alarm Severity Assignment Profile (ASAP)

A user provisioned mechanism to control an alarm level.

Alien Wavelength

A compatible DWDM optical signal that is sourced or terminated by a different network element.

Alternate Mark Inversion (AMI)

A line code that employs a ternary signal to convey binary digits, in which successive binary ones are represented by signal elements that are normally of alternating, positive and negative, polarity but equal in amplitude, and in which binary zeros are represented by signal elements that have zero amplitude.

American Standard Code for Information Interchange (ASCII)

A standard 7-bit code that represents letters, numbers, punctuation marks, and special characters in the interchange of data among computing and communications equipment.

AMI

Alternate Mark Inversion

ANSI

American National Standards Institute

APD

Avalanche PhotoDiode

APS

Automatic Protection Switch

APS Channel

The signalling channel carried in the K1 and K2 bytes of the SONET overhead on the protection line. It is used to exchange requests and acknowledgments for protection switch actions.

ASAP

Alarm Severity Assignment Profile

ASCII

American Standard Code for Information Interchange

ASN.1

Abstract Syntax Notation 1

Asynchronous Transfer Mode (ATM)

A high-speed transmission technology characterized by high bandwidth and low delay. It utilizes a packet switching and multiplexing technique which allocates bandwidth on demand.

ATM

Asynchronous Transfer Mode

Auto

Automatic

Auto

One possible state of ports, lines, and channels. In this state, the port, line, or channel will automatically be put "in service" if a good signal is detected coming from the DSX panel.

Automatic Protection Switch

A feature that allows another source to be automatically selected and reconfigured in the event of a source failure or network change; for example, a fiber cut.

Avalanche Photodiode (APD)

A diode that increases its electrical conductivity by a multiplication effect when hit by light. APDs are used in lightwave receivers because the APDs have a greater sensitivity to weakened light signals (for example, those which have traveled long distances over fiber).

B

B3ZS

Bipolar 3-Zero Substitution

B8ZS

Bipolar 8-Zero Substitution

Backbone Ring

A host ring.

Backout

Refers to backing out of an upgrade in progress. A backout returns a node(s) to the pre-upgrade state.

Backup

The backup and restoration features provide the capability to recover from loss of network element data because of such factors as human error, power failure, and network element design flaws.

Bandwidth

The difference in Hz between the highest and lowest frequencies in a transmission channel. The data rate that can be carried by a given communications circuit.

Baud Rate

Transmission rate of data (bits per second) on a network link.

BDFB

Battery Distribution and Fuse Bay

BER

Bit Error Rate

Bidirectional Line

A transmission path consisting of two fibers that handle traffic in both the transmit and receive directions.

Bidirectional Line-Switched Ring (BLSR)

A bidirectional ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring.

Bidirectional Ring

A ring in which both directions of traffic between any two nodes travel through the same network elements (although in opposite directions).

Bidirectional Switch

Protection switching performed in both the transmit and receive directions.

BIP

Bit Interleaved Parity

Bipolar 8-Zero Substitution (B8ZS)

A line coding technique that replaces eight consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the density requirements of the ones for digital T1 carrier; second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bit

The smallest unit of information in a computer, with a value of either 0 or 1.

Bit Error Rate (BER)

The ratio of error bits received to the total number of bits transmitted.

Bit Error Rate Threshold

The point at which an alarm is issued for bit errors.

Bit Interleaved Parity-N(BIP-N)

A method of error monitoring over a specified number of bits (BIP-3 or BIP-8).

BITS

Building Integrated Timing Supply

BITS clock

A BITS (Building Integrated Timing Source) clock is a clock within a central office that distributes timing to all the equipment in that central office. The BITS clock is tied to an external, stable timing source, such as a GPS (global positioning satellite).

Blocking

The state in which an Ethernet port does not participate in frame relay. The forwarding process discards received frames.

BLSR

Bidirectional line-switched ring

BPDU

Bridge protocol data unit

Bridge Cross-Connection

Setting up a cross-connection leg with the same input tributary as that of an existing cross-connection leg, forming a 1:2 bridge from an input tributary to two output tributaries.

Broadband

Any communications channel with greater bandwidth than a voice channel; sometimes used synonomously with wideband.

Burst Size

The provisioned burst size determines the length or size of the data burst that is allowed by the peak information rate policer. This affects policing for all VLANs (in 802.1Q mode), all port tags (in transparent mode), and all Private Line services (in Private Line or No Tag mode) on the LNW66 Ethernet circuit packs.

Byte

Refers to a group of eight consecutive binary digits.

C

C-Bit

A framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3. This format provides for enhanced performance monitoring of both near-end and far-end entities.

CC

Clear Channel

CCITT

Comité Consultatif International Télégrafique & Téléphonique
(International Telephone and Telegraph Consultative Committee)

CCITT - International Telephone and Telegraph Consultative Committee

An international advisory committee under United Nations sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

CD-ROM

Compact Disk, Read-Only Memory

Channel

A logical signal within a port. For example, for an EC-1 port, there is one STS-1 channel and sometimes 28 VT1.5 channels. See Port.

Channel State Provisioning

A feature that allows a user to suppress reporting of alarms and events during provisioning by supporting multiple states (automatic, in-service and not monitored) for VT1.5 and STS-n channels. See Port State Provisioning.

Circuit

A set of transmission channels through one or more network elements that provides transmission of signals between two points to support a single communications path.

CIT

Craft Interface Terminal

Clear Channel (CC)

A provisionable mode for the DS3 output that causes parity violations not to be monitored or corrected before the DS3 signal is encoded.

CLEI

Common Language Equipment Identifier

Client Signal Fail (CSF)

The local network element sends a Client Signal Fail (CSF) signal to the far-end equipment when a defect is detected in the ingress client signal (Ethernet/Data protocol).

CLK

Clock

CMISE

Common Management Information Service Element

CO

Central Office

Coding Violation (CV)

A performance monitoring parameter indicating that bipolar violations of the signal have occurred.

Collocated

System elements that are located in the same location.

Concatenation

A procedure whereby multiple virtual containers are associated with each other resulting in a combined capacity that can be used as a single container across which bit sequence integrity is maintained.

Constituent Signals

List of received signals for an adaptive rate (pipe mode) optical port.

Cost

Cost is used to help determine the efficiency of any given path. Cost is provisioned for a port (depending on speed of transmission) and calculated automatically for a path (sum of the port costs for the path).

CP

Circuit Pack

CPE

Customer Premises Equipment

CR

Critical (alarm status)

Craft Interface Terminal (CIT)

The user interface terminal used by craft personnel to communicate with a network element.

Credit Interval

The provisioned interval for adding tokens to the token bucket used by the peak information rate policer. This affects policing for all VLANs (in 802.1Q mode), all port tags (in transparent mode), and all Private line services (in Private Line or No Tag mode).

Critical (CR)

Alarm that indicates a severe, service-affecting condition.

CRN

Customer Release Notes

Cross-Connect Capacity

The total bandwidth of cross-connections as measured by the bandwidth of input and output tributaries. A system with N STS-1 equivalent input tributaries and N STS-1 equivalent output tributaries (referred to as "NxN") provides a cross-connection capacity of N STS-1 equivalents. This system could provide N one-way point-to-point cross-connections or N^2 two-way

point-to-point cross-connections at the equivalent rate of STS-1.

Cross-Connect Loopback

A cross-connection from an input tributary to the output of that same tributary via the cross-connect fabric.

Cross-Connect Rate

The attribute of a cross-connection that defines the constituent signal rate(s) it can carry. For a cross-connection with an STS-3 "pipe" cross-connection rate, the constituent signals carried by the cross-connection can be either an STS-3c signal or three STS-1 signals. Similarly, for a cross-connection with an STS-12 "pipe" cross-connection rate, the constituent signals carried by the cross-connection can be either an STS-1 signal or an allowed mix of STS-12c signals and STS-3c signals.

CSF

Client Signal Fail

CTL

Controller

CTS

Customer Technical Support; now known as Technical Support Services (TSS)

Cut-Through

Refers to a simple ASCII interface to an network element. It enables the user to send TL1 messages directly to the network element with no interpretation or assistance provided by the WaveStar CIT.

CV

Coding Violation

CVFE

Coding Violation Far End

D

DACS

Digital Access Cross-Connect System

DACS III-2000

Digital Access and Cross-Connect System that provides clear channel switching at either the DS3 or the STS-1 rates, eliminating the need for manual DSXs.

DACS IV-2000

Digital Access and Cross-Connect System that provides electronic DS3/STS-1 or DS1/VT1.5 cross-connect capability, eliminating the need for manual DSXs.

Data Communications Channel (DCC)

The embedded overhead communications channel in the synchronous line, used for end-to-end communications and maintenance. The DCC carries alarm, control, and status information between network elements in a synchronous network.

Data Communications Equipment (DCE)

The equipment that provides signal conversion and coding between the data terminating equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

Data Terminating Equipment (DTE)

The equipment that originates data for transmission and accepts transmitted data.

dB

Decibels

DC

Direct Current

DCC

Data Communications Channel

DCE

Data Communications Equipment

DDM-2000

Alcatel-Lucent SONET multiplexers that multiplex DS1, DS3, or EC-1 inputs into EC-1, OC-1, OC-3, or OC-12 outputs.

Default Provisioning

The parameter values that are preprogrammed as shipped from the factory.

Demultiplexing

A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

DEMUX

Demultiplexer

DEMUX - Demultiplexer

The DEMUX direction is from the fiber toward the DSX.

Dense Wavelength Division Multiplexing (DWDM)

Transmitting two or more signals of different wavelengths simultaneously over a single fiber.

Digital Cross-Connect Panel (DSX)

A panel designed to interconnect to equipment that operates at a designated rate. For example, a DSX-3 interconnects equipment operating at the DS3 rate.

Digital Multiplexer

Equipment that combines time-division multiplexing several digital signals into a single composite digital signal.

Digital Signal Levels 0, 1, 3 (DS0, DS1, DS3)

An ANSI-defined signal or service level corresponding to the following: DS0 is 64 Kb/s, DS1 is 1.544 Mb/s (equivalent to T1), and DS3 is 44.736 Mb/s (equivalent to 28 T1 channels or T3).

Directory Services Network Element (DSNE)

A designated network element that is responsible for administering a database that maps network element names (TIDs) to addresses (NSAPs - network service access points) in an OSI subnetwork. There can be one DSNE per ring. Can also be a GNE.

Disable admin

An Ethernet port that does not participate in the spanning tree. The port is disabled by management.

Disable failure

A port in this state does not participate in the spanning tree. The port is disabled due to a hardware or software failure.

DLC

Digital Loop Carrier

DRI

Dual Ring Interworking

DS1

Digital Signal Level 1

DS3

Digital Signal Level 3

DS3 Format

Specifies the line format of a DS3 interface port, such as M23 or C-bit parity.

DSCP

Differentiated Services Code Point

DSLAM

Digital Subscriber Line Access Multiplexer

DSNE

Directory Services Network Element

DSX

Digital Cross-Connect Panel

DTE

Data Terminating Equipment

Dual Homing

A network topology in which two OC-3, OC-12, or OC-48 shelves serve as hosts.

DWDM

Dense Wavelength Division Multiplexing

E

E1

E1 is an SDH/PDH (Synchronous Digital Hierarchy/Pleiseosynchronous Digital Hierarchy, the European equivalent of SONET/DSx) electrical signal comparable to (but slightly faster than) a DS1. E1 is also sometimes called CEPT-1 (Conference of European Posts and Telecommunications) and is at 2.048 Mb/s.

EC-1

Electrical Carrier Level 1

EC-1, EC-n - Electrical Carrier

The basic logical building block signal with a rate of 51.840 Mb/s for an EC-1 signal and a rate of n times 51.840 Mb/s for an EC-n signal. An EC-1 signal can be built in two ways: A DS1 can be mapped into a VT1.5 signal and 28 VT1.5 signals multiplexed into an EC-1 (VT1.5 based EC-1), or a DS3 can be mapped directly into an EC-1 (DS3 based EC-1).

ECI

Equipment Catalog Item

EEPROM

Electrically-Erasable Programmable Read-Only Memory

EIA

Electronic Industries Association

Electromagnetic Compatibility (EMC)

A measure of equipment tolerance to external electromagnetic fields.

Electromagnetic Interference (EMI)

High-energy, electrically induced magnetic fields that cause data corruption in cables passing through the fields.

Electronic Industries Association (EIA)

A trade association of the electronic industry that establishes electrical and functional standards.

Electrostatic Discharge (ESD)
Static electrical energy potentially harmful to circuit packs and humans.

EMC
Electromagnetic Compatibility

EMI
Electromagnetic Interference

Enterprise Systems Connection (ESCON)
A 200-Mb/s data signal used in storage area networking applications.

EOOF
Excessive Out of Frame

EoS
Ethernet over SONET

EPORT
Ethernet Port

EPROM
Erasable Programmable Read-Only Memory

EQ
Equipped (memory administrative state)

EQPT
Equipment

Equipment Catalog Item (ECI)
The bar code number on the faceplate of each circuit pack used by some inventory systems.

Errored Seconds (ES)
A performance monitoring parameter.

ES
Errored Seconds

ESD
Electrostatic Discharge

ESF
Extended Super Frame

EST
Environmental Stress Testing

Establish

A user-initiated command, at the WaveStar CIT, to create an entity and its associated attributes in the absence of certain hardware. (Does not apply to Alcatel-Lucent 1665 DMX

Event

A significant change. Events in controlled network elements include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs in a controlled network element, the controlled network element will generate an alarm or status message and send it to the management system.

Extended Superframe Format (ESF)

A T1 format that uses the framing bit for non-intrusive signaling and control. A T1 frame is sent 8,000 times a second, with each frame consisting of a payload of 192 bits, and with each frame preceeded by a framing bit. Because ESF only requires 2,000 framing bits for synchonization, the remaining 6,000 framing bits can be used for error detection.

Externally Timed

An operating condition of a clock in which it is locked to an external reference and is using time constants that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

Extra traffic

Unprotected traffic that is carried over protection channels when their capacity is not used for the protection of working traffic. However, the extra traffic is unprotected and is preempted (lost) if a protection switch is activated. Preempted traffic is reestablished when the protection switch clears.

F

Facility

A one- or two-way circuit that carries a transmission signal.

Facility Loopback

A facility loopback is where an entire line is looped back.

Facility Roll

The disconnection of the circuit cross-connecting input tributary to an output tributary followed, within the required completion time, by a cross-connection of an input tributary to an output tributary.

Failure Rate (FIT)

Circuit pack failure rates per 10^9 hours as calculated using the method described in Reliability Prediction Procedure for Electronic Equipment, *Telcordia* ® Method I, Issue 5, September 1995. One FIT represents one failure per billion operating hours.

Far End (FE)

Any other network element in a maintenance subnetwork other than the one the user is at or is working on. Also called remote.

Far-End Receive Failure (FERF)

An indication returned to a transmitting network element that the receiving network element has detected an incoming section failure. Also known as RFI (Remote Failure Indication).

Fault

Term used when a circuit pack has a hard (not temporary) fault and cannot perform its normal function.

Fault Management

Collecting, processing, and forwarding of autonomous messages from network elements.

FC

Fibre Channel

FC - 1G

Fibre Channel - 1 Gigabit

FC -2G

Fibre Channel - 2 Gigabit

FC-100

Fibre Channel 100 MBps Interface - 1.0625 Gbps line rate.

FC-200

FFibre Channel 200 MBps Interface - 2.125 Gbps line rate.

FCC

Federal Communications Commission

FE

Far End

FE

Fast Ethernet

FE ACTY

Far End Activity

FEBE

Far End Block Error

FEC

Forward Error Correction

FEPROM

Flash EPROM

Fibre Channel - 1G (FC-1G)

A Fibre Channel 1.0625 Gb/s data signal.

Fibre Channel -2G (FC-2G)

A Fibre Channel 2.1250 Gb/s data signal.

Fibre Connection (FICON)

A 1.0625 Gb/s data signal.

File Transfer and Access Management (FTAM)

FTAM is the Open Systems Interconnection (OSI) standard for file transfer, file access, and file management.

Filtering database

The filtering database maintains a dynamic list of paths to which packets should be routed based on the destination address. The database entries are created, updated, and removed by the learning process.

FIT

Failures in 10^9 hours of operation.

Flash EPROM

A technology that combines the nonvolatility of EPROM with the in-circuit reprogrammability of EEPROM (electrically-erasable PROM).

FN

Function Unit

Forced

Term used when a protected entity (either working or protection) has been locked into a service-providing state by user command.

Forced Switch to Protection

The WaveStar CIT command that forces the protection group to be the "Active Unit." The clear command is required to remove the Forced Switch state. While in the Forced Switch state, the system may not switch the active unit either automatically, by means of the WaveStar CIT Forced Switch or Manual Switch command.

Forwarding

The state in which an Ethernet port participates in frame relay.

Free Running

An operating condition of a clock in which its local oscillator is locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

FT-2000

An Alcatel-Lucent SONET OC-48 Lightwave System.

FTAM

File Transfer and Access Management

FTAM-FTP Gateway

The Alcatel-Lucent 1665 DMX supports an FTAM-FTP gateway function. This is also referred to as file transfer translation device (FTTD). The FTTD translates FTAM over OSI presentation to FTP over TCP/IP.

FTP

File Transfer Protocol

FTTD

File Transfer Translation Device

Function Unit (FN)

Refers to any one of a number of different circuit packs that can reside in the A, B, C, or D function unit slots on Alcatel-Lucent 1665 DMX.

G

Gateway Network Element (GNE)

A network element that passes information between other network elements and management systems through a data communication network.

GB

Gigabytes

Gb/s

Gigabits per second

GbE

Gigabit Ethernet

Generic Framing Procedure (GFP)

The Generic Framing Procedure, described in ITU-T G.7041/Y1303, provides a generic mechanism to adapt traffic from higher-layer client signals over a SONET network.

GFP

Generic Framing Procedure

GHz

Gigahertz

GNE

Gateway Network Element

GR-XXX

Telcordia ® General Requirement-XXX

GUI

Graphical User Interface

H

Hairpin Routing

A cross-connection between function units (inter-function unit). For example, function unit C to function units A, B, or D. Also, a cross-connection within the same function unit (intra-function unit). Cross-connections go through Main, but no bandwidth or time slots are taken from the backbone ring. Eliminates need for another shelf.

Hashed FTP

The hashed FTP (digital signature) capability prevents tampering with a downloadable software image.

Holdover

An operating condition of a network element in which its local oscillator is not locked to any synchronization reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

HS

High Speed

Hz

Hertz

I

I/O

Input/Output

IAO LAN

Intraoffice Local Area Network

ID

Identifier

IEC

International Electrotechnical Commission

IEEE

Institute of Electrical and Electronics Engineers

IMF

Infant Mortality Factor

In-Service (IS)

A memory administrative state for ports. IS refers to a port that is fully monitored and alarmed.

INC

Incoming Status

Insert

To physically insert a circuit pack into a slot, thus causing a system-initiated restoral of an entity into service and/or creation of an entity and associated attributes.

Intermediate Reach (IR)

A term used to describe distances of 15 to 40 km between optical transmitter and receiver without regeneration. See long reach.

IP

Internet Protocol

IR

Intermediate Reach

IS

In Service

ISDN

Integrated Services Digital Network

ISO

International Standards Organization

ISP

Internet Service Provider

J

Jitter

Timing jitter is defined as short-term variations of the significant instants of a digital signal from their ideal positions in time.

Jumbo frame

Jumbo frames increase network efficiency by reducing the number of frames to be processed.

K

Kb/s

Kilobits per second

L

LAG

Link Aggregation Group

LAN

Local Area Network

LAPD

Link Access Procedure "D"

LBC

Laser Bias Current

LBO

Lightguide Build Out

LCAS

Link Capacity Adjustment Scheme

LCN

Local Communications Network

LEC

Local Exchange Carrier

LED

Light-Emitting Diode

LFD

Loss of Frame Delineation

LGX

Lightguide Cross-Connect

Light Emitting Diode (LED)

Used on a circuit pack faceplate to show failure (red) or service state. It is also used to show the alarm and status condition of the system.

Lightguide Build-Out (LBO)

An attenuating (signal-reducing) element used to keep an optical output signal strength within desired limits.

Lightguide Cross-Connect (LGX)

A SONET device that contains ports for optical fiber connections to an optical network element. An LGX is used to make and change connections to an network element without changing the cabling on the network element itself.

Line

A transmission medium, together with the associated equipment, required to provide the means of transporting information between two consecutive network elements. One network element originates the line signal; the other terminates it.

Line Timing

The capability to directly derive clock timing from an incoming OC-N signal while providing the user the capability to provision whether switching to an alternate OC-N from a different source (as opposed to entering holdover) will occur if the OC-N currently used as the timing reference for that network element becomes unsuitable as a reference. For example, intermediate nodes in a linear network are line timed. See Loop Timing.

Link Aggregation

A method of combining a group of IEEE 802.3 Ethernet links into a single logical link of up to the aggregate rate.

Link Capacity Adjustment Scheme (LCAS)

LCAS is an enhancement to SONET/SDH Virtual Concatenation that allows adding or removing Virtual Concatenation Group (VCG) members, to vary its bandwidth, by management command. It also automatically removes and restores failed members.

Listening

The state in which an Ethernet port is preparing to participate in frame relay. In the listening state, frame relay is disabled. This is an interim state between blocking and learning.

LOA

Loss of Alignment

Local

See Near-End.

Local Area Network (LAN)

A communications network that covers a limited geographic area, is privately owned and user administered, is mostly used for internal transfer of information within a business, is normally contained within a single building or adjacent group of buildings, and transmits data at a very rapid speed.

Locked DSn Cross-Connections

Locked DSn cross-connections add/drop traffic to/from only one rotation of a UPSR. Path switching is disabled. Time slots can be reused at different nodes around the UPSR.

LOF

Loss of Frame

Long Reach (LR)

A term used to describe distances of 40 km or more between optical transmitter and receiver without regeneration. See Intermediate Reach.

LOP

Loss of Pointer

LOS

Loss of Signal

Loss of Alignment (LOA)

One or more STS-1s that compose a VCG are out of multiframe alignment because of excess delay difference.

Loss of Frame (LOF)

A failure to synchronize to an incoming signal.

Loss of Frame Delineation (LFD)

Lack of sufficient bandwidth that is reported when there is a mismatch in the number of STS tributaries.

Loss of Pointer (LOP)

A failure to extract good data from an STS-n payload.

Loss of Signal (LOS)

The complete absence of an incoming signal.

LPBK

Loopback

LR

Long Reach

LS

Low Speed

M

M23-Format

A standard framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3 (sometimes referred to as M13-format, without C-bit parity).

MAC

Media Access Control

MAC Address

A unique hardware address that identifies each node of a network.

Main

The two slots (M1 and M2) on an Alcatel-Lucent 1665 DMX shelf in which the OC-n (n = 3, 12, 48, or 192) high-speed OLIU circuit packs are installed.

Main shelf

A shelf in a multi-shelf configuration that has one or more provisioned sub-tending sub-shelves.

Maintenance Condition

An equipment state in which some normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that cannot be performed while normal service is being provided.

Major

Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

MB

Megabytes

Mb/s

Megabits per second

Minor (MN)

Indicates a nonservice-affecting failure of equipment or facility.

Miscellaneous Discrete Interface

Allows an operations system to control and monitor equipment collocated within a set of input and output contact closures.

MJ

Major Alarm

MM

Multimode

MML

huMan-Machine Language

MN

Minor Alarm

MPEG

Moving Picture Experts Group

MSPP

Multi Service Provisioning Platform

MTBF

Mean Time Between Failures

MTBMA

Mean Time Between Maintenance Activities

Mult

Multipling

Multi Service Provisioning Platform (MSPP)

SONET Add/Drop Multiplexer Network Element with Ethernet/Data capability.

Multiplexer

A device (circuit pack) that combines two or more transmission signals into a combined signal on a shared medium.

Multiplexing

The process of combining multiple signals into a larger signal at the transmitter by a multiplexer. The large signal is then split into the original smaller signals at the receiver by a demultiplexer.

MUX

Multiplex

N

NA

Not Applicable

NARTAC

North American Regional Technical Assistance Center

NE

network element

NE ACTY

Near-End Activity

Near End

The network element the user is at or is working on. Also called local.

NEBS

Network Equipment-Building System

Network Element (NE)

A node in a telecommunication network that supports network transport services and is directly manageable by a management system.

Network Service Access Point (NSAP) Address

Network Service Access Point Address (used in the OSI network layer 3). An automatically assigned number that uniquely identifies a network element for the purposes of routing DCC messages.

Network Time Protocol

Network time protocol is an easy, accurate, and automatic method to get and synchronize date/time.

NIC

Network Interface Card

nm

Nanometer (10^{-9} meters)

NMA

Network Monitoring and Analysis

NMON

Not Monitored (provisioning state)

No Request State

This is the routine-operation quiet state in which no external command activities are occurring.

Node

A network element in a ring or, more generally, in any type of network. In a network element supporting interfaces to more than one ring, node refers to an interface that is in a particular ring. Node is also defined as all equipment that is controlled by one system controller. A node is not always directly manageable by a management system.

Nonpreemptible unprotected traffic (NUT)

Traffic carried on (working and/or protection) BLSR channels for which protection switching has been provisioned as disabled. NUT must be employed when using an alternate protection scheme for data such as RSTP. As the name implies, NUT is unprotected and not preempted in the event of a protection switch. NUT carried on nonpreemptible unprotected channels affords a higher level of survivability as compared to extra traffic, which is preempted during a protection switch, but a lower level of survivability as compared to working traffic, which is carried on its corresponding protection channel during a protection switch.

Nonrevertive Switching

In nonrevertive switching, an active and standby line exist on the network. When a protection switch occurs, the standby line is selected to support traffic, thereby becoming the active line. The original active line then becomes the standby line. This status remains in effect even when the fault clears. That is, there is no automatic switch back to the original status.

Nonvolatile Memory (NVM)

Memory that retains its stored data after power has been removed. An example of NVM would be a hard disk.

Not Monitored (NMON)

A provisioning state for equipment that is not monitored or alarmed.

NR

Not Reported

NRZ

Nonreturn to Zero

NSA

Not Service Affecting

NSAP Address

Network Service Access Point Address (used in the OSI network layer 3)

NTF

No Trouble Found

NTP

Network time protocol

NUT

Nonpreemptible unprotected traffic

NVM

Non-Volatile Memory

O

OAM&P

Operations, Administration, Maintenance, and Provisioning

OC-1

Optical Carrier, Level 1 Signal (51.84 Mb/s)

OC-12

Optical Carrier, Level 12 Signal (622.08 Mb/s)

OC-192

Optical Carrier, Level 192 Signal (9953.28 Mb/s) (10 Gb/s)

OC-3

Optical Carrier, Level 3 Signal (155.52 Mb/s)

OC-48

Optical Carrier, Level 48 Signal (2488.32 Mb/s) (2.5 Gb/s)

OC, OC-n - Optical Carrier

The optical signal that results from an optical inversion of an STS signal; that is, OC-1 from STS-1 and OC-n from STS-n.

OCH

Optical Channel

OI

Operations Interworking

OLIU

Optical Line Interface Unit

OOF

Out of Frame

OOL

Out of Lock

OOS

Out-of-Service

Open Systems Interconnection (OSI)

Referring to the OSI reference model, a logical structure for network operations standardized by the International Standards Organization (ISO).

Operations Interface

Any interface providing you with information on the system behavior or control. These include the equipment LEDs, SYSCTL faceplate, WaveStar CIT, office alarms, and all telemetry interfaces.

Operations Interworking (OI)

The capability to access, operate, provision, and administer remote systems through craft interface access from any site in a SONET/SDH network or from a centralized operations system.

Operations System (OS)

A central computer-based system used to provide operations, administration, and maintenance functions.

OPS/INE

Operations System/Intelligent Network Element

Optical Channel (OCH)

The top layer of the DWDM network that provides transport of client signals (for example, SONET, 1GE, OTU2). The OCH layer is comparable in function to the SONET path layer.

Optical Channel Transport Unit 2 (OTU2)

The OTU2 is the information structure used for transport over one or more optical channel connections. It consists of the optical channel data unit and OTU2 related overhead (FEC and overhead for management of an optical channel connection). It is characterized by its frame structure, bit rate, and bandwidth.

Optical Transport Network (OTN)

Network used to transport user signals via ITU compliant wavelengths. The OTN is composed of the OTU2, OCH, and OTS layers.

Optical Transport Section (OTS)

The lowest layer of the OTN that provides physical transport. The OTS layer is terminated on an OTS terminating equipment. The OTS layer is comparable in function to the SONET section layer.

OS

Operations System

OSI

Open Systems Interconnection

OSMINE

Operations Systems Modifications for the Integration of Network Elements

OSP

Outside Plant

OTN

Optical Transport Network

OTS

Optical Transport Signal

OTU2

Optical Channel Transport Unit 2

P

P-bit

Performance Bit

Pass Through

Paths that are cross-connected directly across an intermediate node in a ring network.

Path

A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

Path Protection Group

The part of a cross-connection topology that is provisioned to provide path-level protection switching for all the constituent signals carried by the cross-connection. A path protection group can be identified as an entity by its logical output tributary and its cross-connection rate. A path protection group consists of one or more constituent path selectors.

PC

Personal Computer

PCMCIA

Personal Computer Memory Card International Association

Peak Information Rate Policer

The peak information rate policer meters packet traffic leaving the internal packet switch and going toward the SONET network. If the packets exceed the provisioned peak information rate, the packets are dropped.

Performance Monitoring (PM)

Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

PID

Program Identification

Pipe Mode

Alcatel-Lucent 1665 DMX supports cross-connections on adaptive rate OC-n ports (pipe mode). The signal rates adapt to the supported set of signal rates. Cross-connections may be provisioned at any cross-connection rate that is supported for the tributaries associated with the OC-n ports. A cross-connection can carry any set of constituent signals; however, the total of the constituent signal rates must not exceed the cross-connection rate. Fault monitoring and performance monitoring occur on the accepted incoming rates.

PIR

Peak information rate

PJC

Pointer Justification Count

Plesiochronous Network

A network that contains multiple maintenance subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant. For example, in SONET networks, each timing traceable to their own Stratum 1 clock are considered plesiochronous with respect to each other

PLL

Phase-Locked Loop

PM

Performance Monitoring

POP

Points of Presence

Port (also called Line)

The physical interface, consisting of both an input and output, where an electrical or optical transmission interface is connected to the system and may be used to carry traffic between network elements. The words "port" and "line" may often be used synonymously. "Port" emphasizes the physical interface, and "line" emphasizes the interconnection. Either may be used to identify the signal being carried.

Port Protection Group

A user provisioned association of protected optical interface ports. This association is used for line protection. The group of ports represent both a protection switching entity and also a set of lines that carry services to/from another network element. The port protection groups also determine the set of logical tributaries from and to which cross-connections can be provisioned.

Port State Provisioning

A feature that allows a user to suppress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports.

Ported Mode

In the Ported mode, a DS3 port receives and transmits a DS3 signal on the backplane electrical interface to the DSX.

Portless Mode

In the Portless mode, a DS3 port does not use backplane electrical connector. This mode is used to map a DS1 being received in a channelized DS3 within an STS1 into a VT, and vice versa. The DS1 is cross-connected at the VT1.5 level.

POTS

Plain Old Telephone Service

PRBS

Psuedo-random Bit Sequence

Proactive Maintenance

Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect (for example, performance monitoring).

Protection

Extra capacity (channels, circuit packs) in transmission equipment that is not intended to be used for service, but rather to serve as backup against failures.

Protection Group

A logical grouping of ports or circuit packs that share a common protection scheme; for example, UPSR switching or 1+1 line.

PROTN

Protection

Provisioning

The modification of certain programmable parameters that define how the node functions with various installed entities. These modifications are initiated locally or remotely by either a CIT or an OS. They may arrive at the node via the IAO LAN, CIT port, or any DCC channel. The provisioned data is maintained in NVM and/or hardware registers.

PTM

Pluggable Transmission Module

PWR

Power

Q

QoS

Quality of Service

R

RADIUS

Remote Authentication Dial In User Service

RAI

Remote Alarm Indication

RAM

Random Access Memory

RDI

Remote Defect Indication

Reactive Maintenance

Refers to detecting defects/failures and clearing them.

Remote

See Far-End (FE).

Remote Defect Indication (RDI)

An indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure. [Previously called far-end-receive failure (FERF).]

Remote Network Element

Any network element that is connected to the referenced network element through either an electrical or optical link. It may be the adjacent node on a ring or N nodes away from the reference. It also may be at the same physical location, but is usually at another (remote) site.

Revertive

A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the service equipment is active, and the protection equipment is standby) after the clearing of any failure conditions that caused a protection switch to occur or after any external switch commands are reset. See Nonrevertive.

RFI

Remote Failure Indication

Ring

A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over a protection line.

Ring (0x1) Low-Speed Interface

Formerly referred to as dual 0x1 or single 0x1. In ring applications, Alcatel-Lucent 1665 DMX may use a 0x1 interface, meaning both fibers carry service, as opposed to a linear (1+1) low-speed interface where one fiber is used for service and other for protection. See 1+1.

RNE
Remote network element

Root node
The node from which path cost to any other node is measured.

RSTP
Rapid Spanning Tree Protocol

RTAC
Alcatel-Lucent Regional Technical Assistance Center (1-800-225-RTAC)

RTRV
Retrieve

RU
Rack Unit

RZ
Return to Zero

S

SA
Service Affecting

SARB
Status All Resources Busy

SARB Error
This error response indicates the condition “Status, All Resources Busy.”

SD
Signal Degrade

SEFS
Severely Errored Frame Seconds

Self-Healing
Ring architecture in which two or more fibers are used to provide route diversity. Node failures only affect traffic dropped at the failed node.

Service
The operational mode of a physical entity that indicates that the entity is providing service. This designation will change with each switch action.

SES
Severely Errored Seconds

Severely Errored Seconds (SES)

This performance monitoring parameter is a second in which a signal failure occurs, or more than a preset amount of coding violations (dependent on the type of signal) occur.

SF

Super Frame (format for DS1 signal)

SFP

Small Form Factor Pluggable - Type of pluggable transmission modules used for OC-3, OC-12, OC-48, and optical Ethernet/Data interfaces.

Shelf ID

A switch-settable parameter with values from 1 to 8. Used to log into a selected shelf in a bay using the CIT (does not apply to Alcatel-Lucent 1665 DMX).

Shelf View

A graphical depiction of one shelf. Selectable objects in this view are the shelf, the slots/circuit packs, and the ports.

SID

System Identification

Site ID

A switch-settable parameter with values from 1 to 8. Displayed on the SYSCTL circuit pack to indicate to which site the faceplate alarms and LEDs apply (does not apply to Alcatel-Lucent 1665 DMX).

SLA

Service Level Agreement

Slot

A physical position in a shelf for holding a circuit pack and connecting it to the backplane. This term is also used loosely to refer to the collection of ports or tributaries connected to a physical circuit pack placed in a slot.

SM

Single Mode

SMC

SONET Minimum Clock

SNMP

Simple Network Management Protocol

Software Backup

The process of saving an image of the current network element's databases, which are contained in its NVM, to a remote location. The remote location could be the WaveStar CIT or an OS.

Software Download

The process of transferring a software generic from a remote entity to the target network element's memory. The remote entity may be the WaveStar CIT or an OS. The download procedure uses bulk transfer to move an uninterpreted binary file into the network element.

SONET

Synchronous Optical NETwork

Spanning Tree Group

Nodes can be provisioned to belong to a spanning tree group. Only the nodes within that group participate in the spanning tree for the group.

SPE

Synchronous Payload Envelope

Squelch Map

This map contains information for each cross-connection in a ring and indicates the source and destination nodes for the low-speed circuit that is part of the cross-connection. This information is used to prevent traffic misconnection in rings with isolated nodes or segments.

Stand-alone shelf

A shelf that does not have provisioned sub-tending sub-shelves and is not provisioned to operate as a sub-shelf.

Standby

Standby identifies a protected entity which is not currently selected by the receiver at either end as the payload carrying signal hat is not currently carrying service. See Active.

Standing Condition

A standing condition (SC) is either an event (usually user initiated such as a switch request) or an alarm that is provisioned NA (Not Alarmed).

Status

The indication of a short-term change in the system.

STQ

Secondary Transit Queue

Stratum 3 Timing Generator

The timing generator circuit pack, located in the high-speed OLIU circuit pack, that generates clock signals for distribution to the transmit circuits. It operates in the free-running, line-timing, externally timed, and holdover modes.

STS-1 SPE

STS-1 Synchronous Payload Envelope

STS-1 SPE - STS-1 Synchronous Payload Envelope

A 125-µsec frame structure composed of STS path overhead and the STS-1 payload.

STS-12c

Synchronous Transport Level 12 Concatenated Signal

STS-192c

Synchronous Transport Level 192 Concatenated Signal

STS-3c

Synchronous Transport Level 3 Concatenated Signal

STS-3c

Synchronous Transport Level 3 Concatenated Signal. *See OC-3c*.

STS-48c

Synchronous Transport Level 48 Concatenated Signal

STS, STS-n

Synchronous Transport Signal

STS, STS-n - Synchronous Transport Signal

The basic building block signal with a rate of 51.840 Mb/s for an STS-1 signal and a rate of n times 51.840 Mb/s for an STS-n signal.

STU

Synchronized - Traceability Unknown

Sub-shelf

A shelf in a multi-shelf configuration that is provisioned to operate as a sub-tending sub-shelf.

Subnetwork

A group of interconnected/interrelated network elements. The most common connotation is a synchronous network in which the network elements have data communications channel (DCC) connectivity.

Superframe Format (SF)

A DS1 framing format in which 24 DS0 time slots plus a coded framing bit are organized into a frame which is repeated 12 times to form the superframe.

Suspend

Suspend refers to temporarily stopping an upgrade in progress.

Synchronization Messaging

SONET synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

Synchronous Network

The synchronization of transmission systems with synchronous payloads to a master (network) clock that can be traced to a reference clock.

Synchronous Optical Network (SONET)

The North American standard for the rates and formats that defines optical signals and their constituents.

Synchronous Payload

Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame. Therefore, no variable bit-stuffing rate adjustments are required to fit the payload in the transmission signal.

Synchronous Payload Envelope (SPE)

The combined payload and path overhead of an STS-1, STS-3c, STS-12c, STS-48c, , or STS-192c signal.

SYSCTL

System Controller (circuit pack)

SYSCTL - System Controller

The system controller circuit pack that provides overall administrative control of the terminal.

System View

A graphical depiction of the entire network element. Selectable objects in this view are the bays and shelves.

T

T1

A carrier system that transmits at the rate of 1.544 Mb/s (a DS1 signal).

T1X1 and T1M1

The ANSI committees responsible for telecommunications standards

T2

A carrier system that transmits at the rate of 6.312 Mb/s (a DS2 signal).

T3

A carrier system that transmits at the rate of 44.736 Mb/s (a DS3 signal).

TA

Telcordia ® Technical Advisory

Target Identifier (TID)

A provisionable parameter that is used to identify a particular network element within a network. It is a character string of up to 20 characters where the characters are letters, digits, or hyphens (-).

TARP

Target Identifiers Address Resolution Protocol

TBD

To Be Determined

TCA

Threshold-Crossing Alert

TCP/IP

Transmission Control Protocol/Internet Protocol

TDC

TARP Data Cache

TDM

Time Division Multiplexing

Telcordia ®

Telcordia ® is a well-recognized telecommunications' standards organization.

Test Access

A set of cross-connection topologies used in conjunction with a testing system to monitor and "split" signal paths for purposes of fault isolation.

Threshold-Crossing Alert (TCA)

A message type sent from a network element that indicates that a certain performance monitoring parameter has exceeded a specified threshold.

Through (or Continue) Cross-Connection

A cross-connection within a ring, where the input and output tributaries have the same tributary number but are in lines opposite each other.

Through Timing

Refers to a network element that derives its transmit timing in the east direction from a received line signal in the east direction and its transmit timing in the west direction from a received line signal in the west direction.

THz

Terahertz (10^{12} Hz)

TID

Target Identifier

Time Division Multiplexing (TDM)

A technique for transmitting a number of separate data, voice, and/or video signals simultaneously over one communications medium by interleaving a portion of each signal one after another.

Time Slot Assignment (TSA)

A capability that allows any tributary in a ring to be cross-connected to any tributary in any lower-rate, nonring interface or to the same-numbered tributary in the opposite side of the ring.

Time Slot Interchange (TSI)

A set of nodes configured as a ring with paths established in both directions of the ring. Switching occurs per-path at the drop nodes.

TIRKS

Trunks Integrated Records Keeping System

TL1

Transaction Language 1

TR

Telcordia ® Technical Requirement

Transaction Language One (TL1)

The permission level associated with each user login that defines which commands the user can execute.

Transparent Mode

In Transparent Mode, port tags (which are actually VLAN tags with a TPID value other than 8100hex) are used to separate traffic for different customers. A port tag is added to each incoming frame at the ingress LAN port. The port tag contains a provisionable customer ID and priority level.

Tributary

A path-level unit of bandwidth within a port, or the constituent signal(s) being carried in this unit of bandwidth; for example, an STS-1 tributary within an OC-N port.

TSA

Time Slot Assignment

TSI

Time Slot Interchange

TSO

Technical Support Organization

TSS

Technical Support Services

U

UAS

Unavailable Seconds

Unavailable Seconds (UAS)

In performance monitoring, the count of seconds in which a signal is declared failed or in which 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

Unidirectional Path-Switched Ring (UPSR)

Path-Switched rings employ redundant fiber optic transmission facilities in a pair configuration, with one fiber transmitting in one direction (for example, East) and the backup fiber transmitting in the other direction (for example, West). If the primary ring fails, then the protection ring takes over.

UPD/INIT

Update/Intialize

UPD/INIT

A push button on the SYSCTL faceplate.

UPSR

Unidirectional Path Switched Rings

User Privilege

Permits a user to perform on the computer system on which the system software runs.

V

VAC

Volts Alternating Current

VCG

Virtual Concatenation Group

VDC

Volts Direct Current

Virtual LAN (VLAN)

A virtual LAN (VLAN) is a subset of a LAN. A VLAN is created by putting VLAN IDs in packets that indicate membership to a VLAN of that ID. A Local Area Network (LAN) can have multiple VLANs within it, up to the number of IDs available. Members (ports) of different VLANs do not see the traffic of VLANs of which they are not members. A port may be a member of many VLANs (LAN ports in 802.1Q mode, WAN ports). In the Transparent mode, a LAN port is typically assigned membership to a single VLAN.

In Transparent mode, VLANs are assigned to ports using Port Tag (ed-eport and ed-vcg. In 802.1Q mode, VLANs are assigned to ports using VLAN IDs (ent-vlan/ed-vlan).

A VLAN tag is the specific field of information in a packet that carries the VLAN ID number.

Virtual Switch

A virtual switch is a grouping of ports on an Ethernet switch that results in partitioning of the switch into multiple "logical" switches. A port may only be a member of one virtual switch.

Virtual Tributary (VT)

A structure designed for transport and switching of sub-STS-1 payloads. There are currently four sizes: VT1.5 (1.728 Mb/s), VT2 (2.304 Mb/s), VT3 (3.456 Mb/s), and VT6 (6.912 Mb/s).

VLAN

Virtual Local Area Network

VLF

Very Large Fabric

VM

Violation Monitor

VMR

Violation Monitor and Removal

VoIP

Voice over Internet Protocol

VPN

Virtual Private Network

vslot

Virtual Slot

VT

Virtual Tributary

VT-G - Virtual Tributary Group

A 9-row by 12-column SONET structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte-interleaved within the VT-organized STS-1 synchronous payload envelope

VT1.5

Virtual Tributary 1.5 (1.728 Mb/s)

VT1.5 Tributary

A SONET logical signal with a data rate of 1.728 Mb/s. In the 9-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies 12 columns of the 9-row structure and, for VT1.5s, contains four VTs per group.

W

Wait to Restore Time (WRT)

Corresponds to the time to wait before switching back after a failure has cleared (in a revertive protection scheme). The WRT can be between 0 and 12 minutes, in increments of 1 minute.

Wait-to-Rename

Wait to Rename timer for Optimized 1+1 optical line protection. After a protection switch clears, the system waits the provisioned length of time before renaming the working section 1 and working section 2 as Primary and Secondary.

WAN

Wide Area Network

Wavelength Division Multiplexing (WDM)

A means of increasing the information-carrying capacity of an optical fiber by simultaneously transmitting signals at different wavelengths.

WDCS

Wideband Digital Cross-Connect System

WDM

Wavelength Division Multiplexing

Wide Area Network (WAN)

A communication network that uses common-carrier provided lines and covers an extended geographical area.

Wizard

A form of user assistance that automates a procedure through a dialog with the user.

WTR

Wait to Restore Time

X

XFP

10 Gb/s Small Form Factor Pluggable - Type of pluggable transmission modules used for OC-192 interfaces.

Z

Zero Code Suppression

A technique used to reduce the number of consecutive zeros in a line-codes signal (B3ZS for DS3 signals and B8ZS for DS1 signals).

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