Tivoli® IBM Tivoli NetView for z/OS

IBM

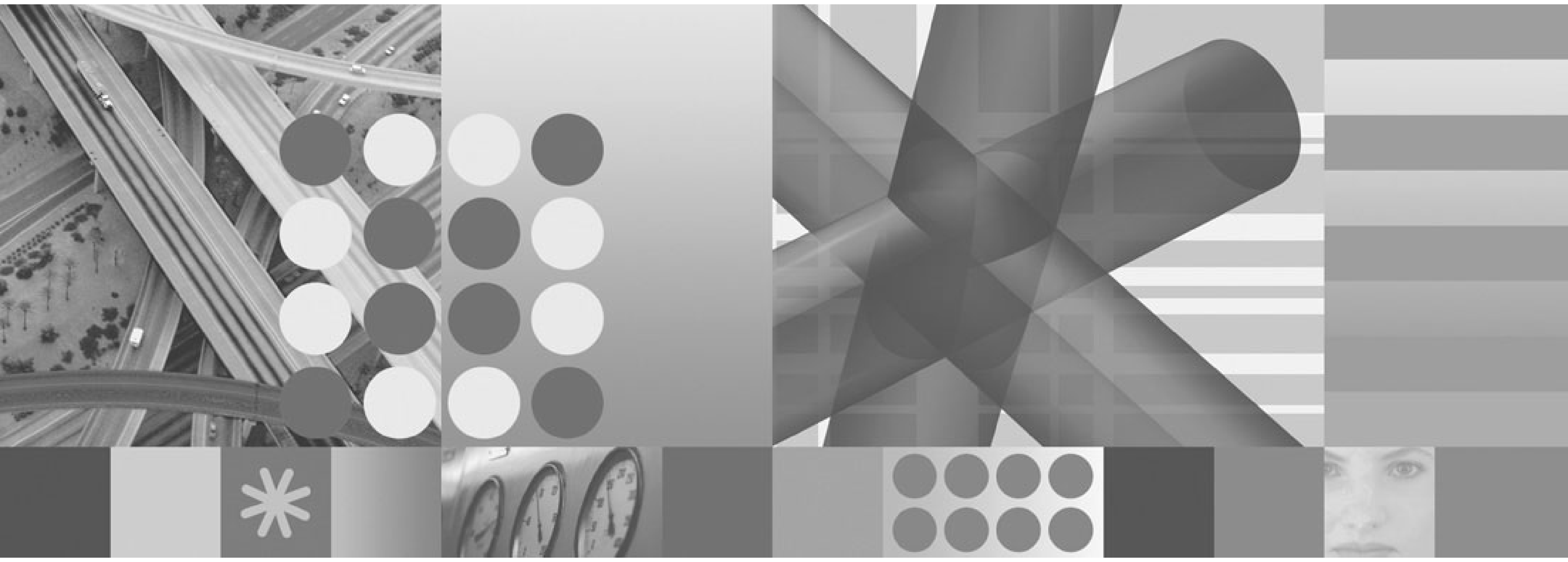
Version 5 Release 3

Automated Operations Network Customization Guide

SC31-8871-03

Tivoli® IBM Tivoli NetView for z/OS

Version 5 Release 3



Automated Operations Network Customization Guide

SC31-8871-03

Note

Before using this information and the product it supports, read the information in "Notices" on page 269.

This edition applies to version 5, release 3 of IBM Tivoli NetView for z/OS (product number 5697-ENV) and to all subsequent versions, releases, and modifications until otherwise indicated in new editions.

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About this publication

The IBM® Tivoli® NetView® for z/OS® product provides advanced capabilities that you can use to maintain the highest degree of availability of your complex, multi-platform, multi-vendor networks and systems from a single point of control. This publication, the *IBM Tivoli NetView for z/OS Automated Operations Network Customization Guide*, describes customization and programming activities used to tailor and extend the automated operations capabilities of the NetView Automated Operations Network (AON). AON provides event-driven network automation implemented from a NetView base.

Intended audience

This publication is for system programmers and lead operations personnel who are responsible for customizing AON. Readers should have experience using the NetView program and should understand the requirements of their network.

Publications

This section lists publications in the IBM Tivoli NetView for z/OS library and related documents. It also describes how to access Tivoli publications online and how to order Tivoli publications.

IBM Tivoli NetView for z/OS library

The following documents are available in the Tivoli NetView for z/OS library:

- *Administration Reference*, SC31-8854, describes the NetView program definition statements required for system administration.
- *Application Programmer's Guide*, SC31-8855, describes the NetView program-to-program interface (PPI) and how to use the NetView application programming interfaces (APIs).
- *Automated Operations Network Customization Guide*, SC31-8871, describes how to tailor and extend the automated operations capabilities of the NetView Automated Operations Network (AON) component, which provides event-driven network automation.
- *Automated Operations Network User's Guide*, GC31-8851, describes how to use the Automated Operations Network component to improve system and network efficiency.
- *Automation Guide*, SC31-8853, describes how to use automated operations to improve system and network efficiency and operator productivity.
- *Command Reference Volume 1*, SC31-8857, and *Command Reference Volume 2*, SC31-8858, describe the NetView commands, which can be used for network and system operation and in command lists and command procedures.
- *Customization Guide*, SC31-8859, describes how to customize the NetView product and points to sources of related information.
- *Data Model Reference*, SC31-8864, provides information about the Graphic Monitor Facility host subsystem (GMFHS), SNA topology manager, and MultiSystem Manager data models.
- *Installation: Configuring Additional Components*, SC31-8874, describes how to configure NetView functions beyond the base functions.

- *Installation: Configuring Graphical Components*, SC31-8875, describes how to install and configure the NetView graphics components.
- *Installation: Getting Started*, SC31-8872, describes how to install and configure the NetView base functions.
- *Installation: Migration Guide*, SC31-8873, describes the new functions provided by the current release of the NetView product and the migration of the base functions from a previous release.
- *Installation: Configuring the Tivoli NetView for z/OS Enterprise Agents*, SC31-6969, describes how to install and configure the Tivoli NetView for z/OS enterprise agents.
- *Messages and Codes Volume 1 (AAU-DSI)*, SC31-6965, and *Messages and Codes Volume 2 (DUI-IHS)*, SC31-6966, describe the messages for the NetView product, the NetView abend codes, the sense codes that are shown in NetView messages, and generic alert code points.
- *MultiSystem Manager User's Guide*, GC31-8850, describes how the NetView MultiSystem Manager component can be used in managing networks.
- *NetView Management Console User's Guide*, GC31-8852, provides information about the NetView management console interface of the NetView product.
- *Programming: Assembler*, SC31-8860, describes how to write exit routines, command processors, and subtasks for the NetView product using assembler language.
- *Programming: Pipes*, SC31-8863, describes how to use the NetView pipelines to customize a NetView installation.
- *Programming: PL/I and C*, SC31-8861, describes how to write command processors and installation exit routines for the NetView product using PL/I or C.
- *Programming: REXX and the NetView Command List Language*, SC31-8862, describes how to write command lists for the NetView product using the Restructured Extended Executor language (REXX™) or the NetView command list language.
- *Resource Object Data Manager and GMFHS Programmer's Guide*, SC31-8865, describes the NetView Resource Object Data Manager (RODM), including how to define your non-SNA network to RODM and use RODM for network automation and for application programming.
- *Security Reference*, SC31-8870, describes how to implement authorization checking for the NetView environment.
- *SNA Topology Manager Implementation Guide*, SC31-8868, describes planning for and implementing the NetView SNA topology manager, which can be used to manage subarea, Advanced Peer-to-Peer Networking®, and TN3270 resources.
- *Troubleshooting Guide*, LY43-0093, provides information about documenting, diagnosing, and solving problems that might occur in using the NetView product.
- *Tuning Guide*, SC31-8869, provides tuning information to help achieve certain performance goals for the NetView product and the network environment.
- *User's Guide*, GC31-8849, describes how to use the NetView product to manage complex, multivendor networks and systems from a single point.
- *Web Application User's Guide*, SC32-9381, describes how to use the NetView Web application to manage complex, multivendor networks and systems from a single point.
- *Licensed Program Specifications*, GC31-8848, provides the license information for the NetView product.

Prerequisite publications

To read about the new functions offered in this release, see the *IBM Tivoli NetView for z/OS Installation: Migration Guide*.

For information about how the NetView for z/OS product interacts with the IBM Tivoli Monitoring product, see the following IBM Tivoli Monitoring publications:

- *Introducing IBM Tivoli Monitoring*, GI11-4071, introduces the components, concepts, and function of IBM Tivoli Monitoring.
- *IBM Tivoli Monitoring: Upgrading from Tivoli Distributed Monitoring*, GC32-9462, provides information on how to upgrade from IBM Tivoli Distributed Monitoring.
- *IBM Tivoli Monitoring: Installation and Setup Guide*, GC32-9407, provides information about installing and setting up IBM Tivoli Monitoring.
- *IBM Tivoli Monitoring User's Guide*, SC32-9409, which complements the IBM Tivoli Enterprise Portal online help, provides hands-on lessons and detailed instructions for all Tivoli Enterprise Portal functions.
- *IBM Tivoli Monitoring Administrator's Guide*, SC32-9408, describes the support tasks and functions required for the IBM Tivoli Enterprise Portal Server and clients.
- *Configuring IBM Tivoli Enterprise Monitoring Server on z/OS*, SC32-9463, describes how to configure and customize the IBM Tivoli Enterprise Monitoring Server running on a z/OS system.
- *IBM Tivoli Monitoring Problem Determination Guide*, GC32-9458, provides information and messages to use in troubleshooting problems with the software.
- *Exploring IBM Tivoli Monitoring*, SC32-1803, provides a series of exercises for exploring IBM Tivoli Monitoring.
- *IBM Tivoli Universal Agent User's Guide*, SC32-9459, introduces the IBM Tivoli Universal Agent.
- *IBM Tivoli Universal Agent API and Command Programming Reference Guide*, SC32-9461, explains how to implement the IBM Tivoli Universal Agent APIs and describes the API calls and command-line interface commands.

Related publications

For information about the NetView Bridge function, see *Tivoli NetView for OS/390 Bridge Implementation*, SC31-8238-03 (available only in the V1R4 library).

You can find additional product information on the NetView for z/OS Web site:

http://www.ibm.com/software/tivoli/products/netview-zos/

Accessing terminology online

The *Tivoli Software Glossary* includes definitions for many of the technical terms related to Tivoli software. The *Tivoli Software Glossary* is available at the following Tivoli software library Web site:

http://publib.boulder.ibm.com/tividd/glossary/tivoliglossarymst.htm

The IBM Terminology Web site consolidates the terminology from IBM product libraries in one convenient location. You can access the Terminology Web site at the following Web address:

http://www.ibm.com/software/globalization/terminology/

For a list of NetView for z/OS terms and definitions, refer to the IBM Terminology Web site. The following terms are used in this library:

NetView
For the following products:
- Tivoli NetView for z/OS version 5 release 3
- Tivoli NetView for z/OS version 5 release 2
- Tivoli NetView for z/OS version 5 release 1
- Tivoli NetView for OS/390® version 1 release 4

MVS™ For z/OS operating systems

MVS element
For the BCP element of the z/OS operating system

CNMCMD
For CNMCMD and its included members

CNMSTYLE
For CNMSTYLE and its included members

PARMLIB
For SYS1.PARMLIB and other data sets in the concatenation sequence

The following IBM names replace the specified Candle® names:

IBM Tivoli Monitoring Services
For OMEGAMON® platform

IBM Tivoli Enterprise Monitoring Agent
For Intelligent Remote Agent

IBM Tivoli Enterprise Monitoring Server
For Candle Management Server

IBM Tivoli Enterprise Portal
For CandleNet Portal

IBM Tivoli Enterprise Portal Server
For CandleNet Portal Server

Unless otherwise indicated, references to programs indicate the latest version and release of the programs. If only a version is indicated, the reference is to all releases within that version.

When a reference is made about using a personal computer or workstation, any programmable workstation can be used.

Using NetView for z/OS online help

NetView for z/OS mainframe online help is available for the following areas, depending on your installation and configuration:
- General help and component information
- Command help
- Message help
- Sense code information
- Recommended actions

Using LookAt to look up message explanations

LookAt is an online facility that you can use to look up explanations for most of the IBM messages you encounter, as well as for some system abends (an abnormal end of a task) and codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can use LookAt from the following locations to find IBM message explanations for z/OS elements and features, z/VM®, VSE/ESA™, and Clusters for AIX® and Linux®:

- The Internet. You can access IBM message explanations directly from the LookAt Web site at http://www.ibm.com/eserver/zseries/zos/bkserv/lookat/.
- Your z/OS TSO/E host system. You can install code on your z/OS or z/OS.e systems to access IBM message explanations, using LookAt from a TSO/E command line (for example, TSO/E prompt, ISPF, or z/OS UNIX® System Services running OMVS).
- Your Microsoft® Windows® workstation. You can install code to access IBM message explanations on the *z/OS Collection* (SK3T-4269), using LookAt from a Microsoft Windows DOS command line.
- Your wireless handheld device. You can use the LookAt Mobile Edition with a handheld device that has wireless access and an Internet browser (for example, Internet Explorer for Pocket PCs, Blazer, or Eudora for Palm OS, or Opera for Linux handheld devices). Link to the LookAt Mobile Edition from the LookAt Web site.

You can obtain code to install LookAt on your host system or Microsoft Windows workstation from a disk on your *z/OS Collection* (SK3T-4269), or from the LookAt Web site (click **Download**, and select the platform, release, collection, and location that suit your needs). More information is available in the LOOKAT.ME files available during the download process.

Accessing publications online

The documentation CD contains the publications that are in the product library. The publications are available in Portable Document Format (PDF), HTML, and BookManager® formats. Refer to the readme file on the CD for instructions on how to access the documentation.

An index is provided on the documentation CD for searching the Tivoli NetView for z/OS library. If you have Adobe Acrobat on your system, you can use the Search command to locate specific text in the library. For more information about using the index to search the library, see the online help for Acrobat.

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli Information Center Web site at http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp.

In the Tivoli Information Center window, click **Tivoli product manuals**. Click the letter that matches the first letter of your product name to access your product library. For example, click **N** to access the Tivoli NetView for z/OS library.

Note: If you print PDF documents on other than letter-sized paper, set the option in the **File → Print** window that enables Adobe Reader to print letter-sized pages on your local paper.

Ordering publications

You can order many Tivoli publications online at the following Web address:

http://www.elink.ibmlink.ibm.com/publications/servlet/pbi.wss

You can also order by telephone by calling one of these numbers:
- In the United States: 800-879-2755
- In Canada: 800-426-4968

In other countries, contact your software account representative to order Tivoli publications. To locate the telephone number of your local representative, perform the following steps:

1. Go to the following Web address:

   http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi
2. Select your country from the list and click **Go**. The Welcome to the IBM Publications Center window is displayed.
3. On the left side of the window, click **About this site** to see an information page that includes the telephone number of your local representative.

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. Standard shortcut and accelerator keys are used by the product and are documented by the operating system. Refer to the documentation provided by your operating system for more information.

For additional information, see the Accessibility appendix in the *User's Guide*.

Tivoli technical training

For Tivoli technical training information, refer to the following IBM Tivoli Education Web site at http://www.ibm.com/software/tivoli/education.

Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

Online
: Go to the IBM Software Support site at http://www.ibm.com/software/support/probsub.html and follow the instructions.

IBM Support Assistant
: The IBM Support Assistant (ISA) is a free local software serviceability workbench that helps resolve questions and problems with IBM software products. The ISA provides quick access to support-related information and serviceability tools for problem determination. To install the ISA software, go to http://www.ibm.com/software/support/isa.

Problem determination guide
: For more information about resolving problems, see the *IBM Tivoli NetView for z/OS Troubleshooting Guide*.

Downloads

Clients and agents, demonstrations of the NetView product, and several free NetView applications that you can download are available at the NetView for z/OS Web site:

http://www.ibm.com/software/tivoli/products/netview-zos/

These applications can help with the following tasks:

- Migrating customization parameters from earlier releases to the current style sheet
- Getting statistics for your automation table and merging the statistics with a listing of the automation table
- Displaying the status of a job entry subsystem (JES) job or canceling a specified JES job
- Sending alerts to the NetView program using the program-to-program interface (PPI)
- Sending and receiving MVS commands using the PPI
- Sending Time Sharing Option (TSO) commands and receiving responses

Conventions used in this publication

This publication uses several conventions for special terms and actions, operating system-dependent commands and paths, and command syntax.

Typeface conventions

This publication uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**, and **Operating system considerations**:)
- Keywords and parameters in text

Italic

- Citations (examples: titles of publications, diskettes, and CDs
- Words defined in text (example: a nonswitched line is called a *point-to-point line*)
- Emphasis of words and letters (words as words example: "Use the word *that* to introduce a restrictive clause."; letters as letters example: "The LUN address must start with the letter *L*.")
- New terms in text (except in a definition list): a *view* is a frame in a workspace that contains data.
- Variables and values you must provide: ... where *myname* represents...

`Monospace`

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user

- Text that the user must type
- Values for arguments or command options

Operating system-dependent variables and paths

For workstation components, this publication uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace $*variable* with %*variable*% for environment variables and replace each forward slash (/) with a backslash (\) in directory paths. The names of environment variables are not always the same in the Windows and UNIX environments. For example, %TEMP% in Windows environments is equivalent to $TMPDIR in UNIX environments.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.

Syntax Diagrams

Syntax diagrams start with double arrowheads on the left (►►) and continue along the main syntax line until they end with two arrowheads facing each other (►◄). When more than one line is needed for a syntax diagram, the continued lines end with a single arrowhead (►).

Position and Appearance of Syntax Elements

Syntax diagrams do not rely on highlighting, brackets, or braces. In syntax diagrams, the position of the elements relative to the main syntax line indicates the required, optional, and default values for keywords, variables, and operands as shown in the following table.

Table 1. Position of Syntax Elements

Element Position	Meaning
On the main syntax line	Required
Above the main syntax line	Default
Below the main syntax line	Optional

Keywords and operands are shown in uppercase letters. Variables are shown in lowercase letters and are either italicized or, for NetView help and BookManager online publications, shown in a differentiating color. The appearance of syntax elements indicates the type of element as shown in the following table.

Table 2. Appearance of Syntax Elements

Element	Appearance
Keyword	CCPLOADF
Variable	*resname*
Operand	MEMBER=*membername*
Default	<u>*today*</u> or INCL

Required Syntax Elements

The command name and the required keywords, variables, and operands are shown on the main syntax line. Figure 1 on page xix shows that the *resname* variable must be used for the CCPLOADF command.

CCPLOADF

```
►►──CCPLOADF resname──────────────────────────────────────────────────►◄
```

Figure 1. Required Syntax Elements

Optional Syntax Elements

Optional keywords, variables, and operands are shown below the main syntax line. Figure 2 shows that the ID operand can be used for the DISPREG command but is not required.

DISPREG

```
►►──DISPREG──┬─────────────┬──────────────────────────────────────────►◄
             └─ID=resname──┘
```

Figure 2. Optional Syntax Elements

Default Keywords and Values

Default keywords and values are shown above the main syntax line.

If the default is a keyword, it is shown only above the main line. You can specify this keyword or allow it to default. Figure 3 shows the default keyword STEP above the main line and the rest of the optional keywords below the main line.

If an operand has a default value, the operand is shown both above and below the main line. A value below the main line indicates that if you specify the operand, you must also specify either the default value or another value shown. If you do not specify the operand, the default value above the main line is used. Figure 3 shows the default values for operands MODNAME=* and OPTION=* above and below the main line.

RID

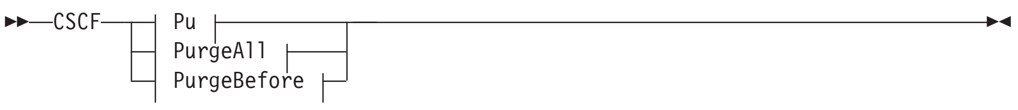
```
                     ┌─,STEP──────┐  ┌─,MODNAME=*──────────┐
►►──RID TASK=opid────┼────────────┼──┼─────────────────────┼──────────►
                     ├─,CONTINUE──┤  └─,MODNAME=──┬─*────┬─┘
                     ├─,END───────┤               └─name─┘
                     └─,RUN───────┘

   ┌─,OPTION=*─────────────┐
►──┼───────────────────────┼──────────────────────────────────────────►◄
   └─,OPTION=──┬─*────────┬┘
               ├─HAPIENTR─┤
               └─HAPIEXIT─┘
```

Figure 3. Default Keywords and Values

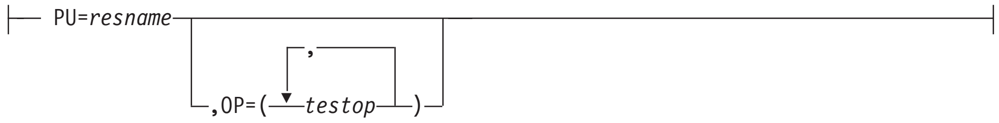
Syntax Fragments

Commands that contain lengthy sections of syntax or a section that is used more than once in a command are shown as separate fragments following the main diagram. The fragment name is shown in mixed case. Figure 4 on page xx shows a syntax diagram with the fragments `Pu`, `PurgeAll`, and `PurgeBefore`.

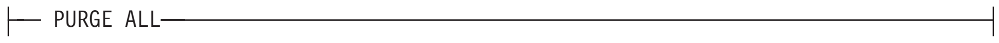
CSCF



Pu



PurgeAll



PurgeBefore

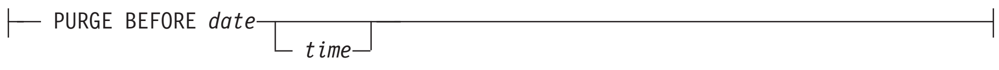


Figure 4. Syntax Fragments

Commas and Parentheses

Required commas and parentheses are shown in the syntax diagram.

When an operand can have more than one value, the values are typically enclosed in parentheses and separated by commas. For example, in Figure 4, the OP operand contains commas to indicate that you can specify multiple values for the *testop* variable.

If a command requires positional commas to separate keywords and variables, the commas are shown before the keyword or variable, as in Figure 3 on page xix.

Commas are also used to indicate the absence of a positional operand. In the following example of the BOSESS command, the second comma indicates that an optional operand is not being used:

```
NCCF BOSESS applid,,sessid
```

You do not need to specify the trailing positional commas. Trailing positional and non-positional commas either are ignored or cause a command to be rejected. Restrictions for each command state whether trailing commas cause the command to be rejected.

Abbreviations

Command and keyword abbreviations are listed in synonym tables after each command description.

Part 1. AON Overview

Chapter 1. Introducing AON

The Automated Operations Network (AON) provides a comprehensive set of programs that can be customized and extended to provide network automation. The following components of AON provide consistent automation across multiple network protocols:

- SNA Automation (AON/SNA)
- TCP/IP Automation (AON/TCP)

AON intercepts alerts and messages that indicate problems with network resources. AON attempts to recover failed resources and monitor resources until they recover. After a resource has recovered, the components of AON keep a record of the resource failures to track recurring network problems.

To automate network functions, AON provides facilities for:

- Online access to centralized information
- Automated problem determination and recovery actions
- User-written routines and user-tailored panels
- Online tutorials and product information through the operator interface.

The following sections describe the programs that enable AON to automate z/OS networks.

Centralized Access to Information

AON enables users to gain access to network information from panels and issue commands to multiple systems from a single terminal. This centralized control is provided by:

- Dynamic Display Facility (DDF)
- Focal-point services
- NetView operator interface

Dynamic Display Facility (DDF)

The DDF is the central focus of resource status information. It displays network resources currently being acted on by AON in an exception based hierarchical panel display. As you add new resources to your network, DDF can automatically reflect those resources without requiring you to change AON control file entries. AON also updates message notifications held by the command facility (NCCF).

The DDF enterprise-wide resource display provides real-time, exception-oriented status monitoring. An operator at the focal-point NetView can view the status of multiple networks from the DDF panels. AON dynamically updates DDF panels with resource status information. Multiple programs can update DDF with resource status without concern for the sequence or priorities posted by other programs. Many operators can view DDF and receive updates without having an impact on the network.

AON provides default settings for DDF to represent the status of your network resources. Default DDF settings display only resources that require operator intervention. The mark function enables operators to take responsibility for a failed resource that requires operator intervention. DDF is updated to indicate who is working on the problem. When failed components recover, DDF automatically removes them from the display.

DDF displays are color-coded to indicate the status of the network components. The color indicates the severity of a failure. If AON detects a problem with a resource, it displays the resource in red, pink, or yellow (default color definitions). Typically, a failure displayed in red is more severe than a failure displayed in yellow. Green (or not displayed) indicates that the resource status is normal.

You can customize DDF settings, including colors. For example, by making a change to the control file you can make DDF display all resources instead of just those that require intervention.

For more information on customizing and using DDF, see Part 2, "Customizing the Dynamic Display Facility (DDF)," on page 13.

NetView Operator Interface

With the NetView operator interface to AON, users can:
- Issue commands
- Receive responses for functions provided by AON and other NetView facilities

Operators can enter commands either in line mode (on any NetView command line) or in full-screen mode. Full-screen mode provides easy-to-use command pop-up windows.

Additionally, NetView management console (NMC) operators can access an AON window to display automated resource recovery information and control file information for SNA resources.

Focal-Point Services

You can specify one domain as the focal point in a multidomain network. AON routines forward notification messages from multiple hosts to a single focal-point host. This enables a network operator to receive all the network notifications at a single console.

To support focal points, you define routes, called *gateways*, from one NetView to another. AON forwards automation notifications, commands, and responses through these gateways.

To implement focal-point services, you define a hierarchical domain structure composed of a focal-point domain and distributed domains. You can also define a backup for the focal-point host, for situations when the primary focal-point host is unavailable. Through focal-point services, you can:
- Enable operators to send commands and receive responses through the gateways. This eliminates the need for personal NetView-NetView task (NNT) sessions for each operator.
- Manage the Resource Access Control Facility (RACF®) passwords for gateway automation operators
- Set up and initiate automated operator NNT sessions
- Display the status of gateway automation operators and user NNT sessions

Automated Recovery

This section describes the AON generic recovery processes. AON provides generic automated recovery processes used by the components of AON, which enable you to focus on other areas of operations. AON automation provides the following benefits:

- Fast recovery
- Great network availability
- Automatic responses to predefined messages
- Reminder notification of unavailable resources or resources that are in manual recovery mode
- Limited operator intervention
- AON categorization recovery as critical or non-critical
- More time for the operations staff to work in other areas where automation is not currently available

Although AON can help you automate and manage several different types of networks, the tasks required to automate these networks are very similar in nature. There are different methods of getting resource status in each type of network, but the basic structure of the automation is essentially the same.

AON includes routines that perform similar tasks on different types of networks. This means that the automation process for systems network architecture (SNA), Advanced Peer-to-Peer Networking (APPN), or Transmission Control Protocol/Internet Protocol (TCP/IP) resources is the same, although the actual programs that perform the automation steps might be different. For example, if a resource fails in a SNA or TCP/IP network, information about the resource (such as resource type, connectivity, and status) must be gathered before automated recovery can continue for that resource. Each of these network types has a different program that gathers resource information, but they are called and processed in the same manner by the AON automation routine.

The benefits of having common automation routines are:

- Code reliability
- Transfer of skill across networks (because the process is the same for the different types of networks)
- Easier problem determination

AON automates network operations such as resource recovery. This section provides an overview of how AON facilitates recovery, and describes the tools it uses to accomplish automation of network operators, including:

- Automation table
- Automated tasks
- Logging
- Providing generic failure and recovery routines
- Sending messages to the notification operators when further action is required
- Sending records to the automation log for tracking purposes

AON supports network resource recovery by monitoring critical resources and taking automated action based on tailored criteria. Each automation component recovers specific types of resources. For example, SNA automation recovers SNA (VTAM®) resources. AON reacts to adverse conditions of network resources and notifies operators of these conditions, when appropriate.

Recovery criteria can be set based on resource type, resource naming convention, explicit resource name, or network-wide settings. You can select a variety of parameters and options to control when and how recovery takes place.

The AON control file contains automation criteria. There are two ways to update the control file, dynamically or statically:

- You can update the control file dynamically through the POLICY command interface or through the AON operator interface. These changes remain in effect until you reload the control file or until the current NetView-started tasks end.
- You can update the control file statically with a system editor, such as the Interactive System Productivity Facility (ISPF). After editing the control file, you can use the POLICY command to reload the control file, reinitialize AON, or recycle your NetView environment.

Automation and Status Logs

To improve problem determination productivity, AON uses automation logs and status logs to record the automation process and status of the network resources.

The status log tracks:

- Last 10 failures of a resource, with the time stamp
- Current automation status and threshold exceptions
- Last operator notified about a resource or one that took action on a resource

Users can issue the AON DSPSTS command to display status log information. AON provides a facility (DBMAINT) to maintain this VSAM status file.

The AON automation log records all automation activity. When a resource becomes unavailable or when the resource becomes available again, AON writes availability records to the log. These records indicate whether the action was caused by automation, the Help Desk function, or by an operator. You can issue the AON NLOG command to view the automation log.

NetView Log

AON writes entries to the NetView log for all significant events relative to the control file. This includes operator messages, internal events, and errors within the control file.

Automation Notification

AON provides you with a notification policy that can be customized to do the following types of operator notification:

- Issue a message.
- Generate an alert or resolution to the hardware monitor.
- Update the DDF.
- Send an event to the IBM Tivoli Enterprise Console®.
- Send an e-mail request.
- Generate a beeper request.

Operators using NetView management console can request Alert History to view alerts generated by AON. AON also sets the `Automation in Progress` status so you can see that automation is attempting to recover the failed resource. Failed resources that cannot be recovered can be seen in the Operator Intervention Network view (OIV).

Automation Table

NetView enables you to issue commands based on any incoming message or Management Services Unit (MSU). You can specify criteria that must be satisfied before running a program. The criteria can include the presence of specific message text data, resource names, other message attributes, or specific MSU data.

AON provides a predefined message table structure (included in DSITBL01) with each component adding prescribed messages, or MSUs, and criteria. When any of these prescribed messages and conditions occur, the AON generic failure or recovery routines are invoked to take action. Actions are defined in the AON option definition tables. In some cases, the automation table directly drives a command list.

Automation Operators

The multiple automation operator design enables AON to divide its workload among several, separately defined automated operators by using the concurrent processing capability of NetView. All AON automation operators are started during initialization and must be active at all times.

The automation operators are identified by unique names corresponding to their responsibilities. For example, some of the automation operators supplied with AON include:

AIPOPER
Sets and resets the AIP (Automation In Progress) operator status bit in RODM. This bit causes a display pattern to be placed on the object in NetView management console. RODM AIP operators issue the commands necessary to update resource objects in RODM views with the AIP operator status. These operators are also used in the management of the OIV processing.

ALRTOPER
Sends alerts and resolutions to NetView over an LU 6.2 session.

BASEOPER
Provides backup for other automation operators.

DVIPOPER
Used for DVIPA polling processes.

GATOPER
The outbound gateway operator for automation notification forwarding.

INFOPER
Serializes the updates to the inform log.

MSGOPER
Formats and issues AON notifications and DDF updates.

NETOPER
Initiates routines based on the NetView automation table and AON generic failure and recovery routines.

NV6KOP
Used for Tivoli NetView for AIX automation

OIVOPER
An optional operator task used by the Operation Intervention View (OIV) function. When enabled, automatically deletes resources from the OIV at specified intervals. Only resources with the display status of satisfactory (129) are removed.

TCPOPER
Used for TCP/IP automation

TRAPOPER
Used for trap automation processes

WKSTOPER
Sends and receives commands and responses between AON and a workstation with the interface installed.

X25OPER
Used by X25 automation processes

For more information, refer to the *IBM Tivoli NetView for z/OS Administration Reference*.

Notification Operators

Notification operators are operators identified (in NTFYOP control file entries) to receive *messages* generated by AON. Notifications are necessary to understand and operate the network. They must be routed to the notification operators or the automation operators.

In a distributed network, notification operators are defined at the focal-point domain. Notification operators can also be defined at the distributed domain. If they are defined at both, notifications are forwarded to notification operators at both the focal point and distributed domains.

If the host that creates the automation notification is not the focal-point domain, the message is forwarded to the focal-point domain. In a single NetView environment, the domain is its own focal point.

When the notification arrives or is generated at the focal-point host, this notification is sent to the notification operators and can be “frozen” on the operator’s screen. AON enables you specify the types of messages that are frozen on the operator’s screen. When notifications are frozen, operators can use the DM command to remove them from the screen.

The notification operators are defined in the control file by operator name, operator description, and message class. For example:

```
NTFYOP OPER1,OPER='OPERATOR 1',CLASS=10
```

The class of the notification is compared to the class of each defined notification operator. Each notification operator with a class matching the class of the automation notification receives the notification. For example, all AON notifications have a class of 90. Therefore, any notification operators defined with CLASS=90 receive all notifications.

Thresholds (SNA Only)

AON tracks resource failures and recoveries in a status file. If the number of errors exceeds a defined threshold over a period of time (which is defined in the THRESHOLDS control file entry), AON alerts the notification operator that the resource is experiencing multiple errors and continues recovery attempts. For critical thresholds, AON stops recovery attempts.

AON uses three types of threshold definitions:

Critical

AON uses critical thresholds to stop automated recovery. AON deactivates the resource and notifies the notification operators. Automated recovery is stopped until an operator reactivates the resource.

Frequent

AON uses frequent thresholds to indicate recurring errors that might warrant an operator's attention. When a resource exceeds a frequent threshold, automated recovery continues, but AON sends a message to the notification operators and makes an entry in the automation log.

Infrequent

AON uses infrequent thresholds to indicate that a resource is experiencing random or intermittent errors. Automated recovery continues, but AON sends a message to the notification operators and makes an entry in the automation log. When a resource fails and one of these thresholds is exceeded, AON sends a notification to the defined AON notification operator.

Large-scale Thresholding

AON uses the LSTHRESH (large scale thresholding) control file entry to count network-wide events of a particular type, and then sets a threshold on the number of times the event can happen over specific period of time.

User Exits

AON is designed to fulfill most automated recovery needs. However, an installation can have particular automation requirements that need to be met. AON provides user exits that you can code for specific recovery processing, monitored intervals, threshold checking, and SNA resource information gathering.

You set user exit values in the control file. The user exits are run from certain AON common routines.

For more information on user exits, see Chapter 10, “AON User Exits,” on page 213.

System Console

AON uses the NetView write-to-operator with reply (WTOR) facility to communicate with and solicit responses from the system operator. Likewise, a system operator can run AON routines and commands from the system console by preceding the command with the subsystem designation assigned to NetView.

Database Maintenance Facility (DBMAINT)

AON provides a database maintenance facility (DBMAINT) that performs database maintenance for the NetView hardware monitor and session monitor. You can also use DBMAINT to purge records from the AON status file. This database maintenance includes the deletion of records prior to a specified date and the reorganization of the VSAM database.

DBMAINT uses the ENVIRON SETUP entry in the AON control file to correctly perform database maintenance. The ENVIRON SETUP control file entry must match the way the VSAM database was allocated, or errors occur.

You can use the DBMAINT facility from a full-screen operator interface panel or you can schedule it to run on an automation operator station task. The latter can be achieved by building a Timer entry in the AON control file that runs DBMAINT at a specific time and date. This process automates database and file maintenance. If also enables you to schedule database maintenance during non-peak hours of operation.

Tailored Routines and Displays

You can expand the AON functions to meet additional automation needs unique to your network systems. You can do this by:
- Tailoring the EZLCFG01 control file
- Using the common routines provided with AON

Tailoring the EZLCFG01 Control File

NetView loads the DSIPARM member EZLCFG01 control file during initialization. This file contains values such as the notification operator IDs, the automation operator IDs, threshold values for resources, monitoring values, and recovery values. In most cases you can change the control file values without restarting NetView, because the new values become effective as soon as the AON control file is reloaded.

The data in the control file is organized by keywords, and therefore is independent of the program language or operating system. You can set values for individual resources, resource types, or system-wide defaults. This reduces the need for generating a set of variables to contain the information needed for each individual resource. You can input your own data in the AON control file to have a common depository for information used by programs on your network.

When you first install AON, system programmers customize control file entries for their network needs.

For more information, see the *IBM Tivoli NetView for z/OS Automation Guide*.

Using the Common Routines Provided with AON

AON includes routines that you can use to code network automation extensions. These routines provide easy-to-use generic functions for expanding automation capabilities beyond those supplied and supported by AON. You can use these generic functions to reduce development time when you create procedures or extend those provided.

Common routines perform automated actions such as transferring information and checking the control file. User-written programs can call common routines from the message table, control file, or an extended routine to accomplish a required task.

For more information on common AON routines, see Chapter 8, “Coding Common Routines,” on page 141.

Cross-Domain Logon

With AON cross-domain logon (CDLOG), you can log on to all or a select group of domains. CDLOG enables you to select which domains you want.

If CDLOG is unable to establish a session with the domain you selected, it displays the message received when attempting to start the session. After trying to set up sessions with other NetView domains, CDLOG indicates the status of all the domains in the domain list.

To use the AON/SNA Help Desk for resources in another domain, you must define the CDLOG entry. The SNA Help Desk determines which domain owns a resource. For the help desk to do this, however, you must be able to log on to all the domains known to your NetView. Automatic logon has two types of logon procedures:

- Automatic mode
- Semiautomatic mode

Automatic mode takes the operator ID and password from the control file and logs on to the selected domains. Semiautomatic mode requires operator action to select domains and provide passwords.

The AON remote gateway (RGWY command) requires CDLOG definitions to start RMTCMD sessions. Several AON functions use the remote gateway sessions.

Part 2. Customizing the Dynamic Display Facility (DDF)

Chapter 2. Understanding Dynamic Display Facility (DDF) Design

The Dynamic Display Facility (DDF) enables you to identify and focus on a specific problem in the network. The DDF functions enable you to alter or extend your DDF installation. This chapter describes the structure and processing of DDF:
- Understanding the hierarchical display of DDF
- Defining dependencies
- Defining the priority and color of the resources
- Updating status
- Defining panels
- Defining multiple systems
- Implementing DDF
- Defining the contents of DDF
- Understanding the flow of DDF
- Starting and stopping DDF
- Loading panels
- Loading tree structures
- Using the definition procedure

Note: Most of the examples used in this chapter are specific to Systems Network Architecture (SNA) resources, but the concepts apply to all AON automation components. To customize DDF to suit your environment, modify one or more members in DSIPARM and DDF panels in CNMPNL1. Sample members and panels are provided. Those samples contain references to domain CNM01. You cannot substitute system symbolics within any of those samples. Instead, you can use the EZLEISP1 utility shipped in CNMCLST. For more information, refer to the *IBM Tivoli NetView for z/OS Installation: Configuring Additional Components*.

Setting up the Dynamic Display Facility for AON

The Dynamic Display Facility (DDF) enables you to identify and focus on a specific problem in the network. DDF uses colors to represent the status of various network resources. DDF can track the error, warning, action, or informational states of network resources. DDF uses tree structures to implement the hierarchical display of status information. Although DDF can display the status of all network resources, you can tailor DDF to display only resources that have an error.

To facilitate the installation of DDF, the distribution tape provides samples to set up a typical DDF implementation. This implementation reflects DDF updates for a single domain (no focal point implementation).

You can use three types of definitions to set up DDF. Each of these types has its own file or files. The definition types are:
- Entries in the control file
- Tree structures (one file per domain)
- Panel characteristics (one file per panel)

The sample control file and panels are set up to run for domain CNM01. If your domain ID is different, change all occurrences of CNM01 to your domain ID in the following members:

- All members whose name starts with EZL (such as EZLCFG01 and EZLTREE)
- All members whose name starts with FKVPN (for AON/SNA)
- All members whose name starts with FKXPN (for AON/TCP)

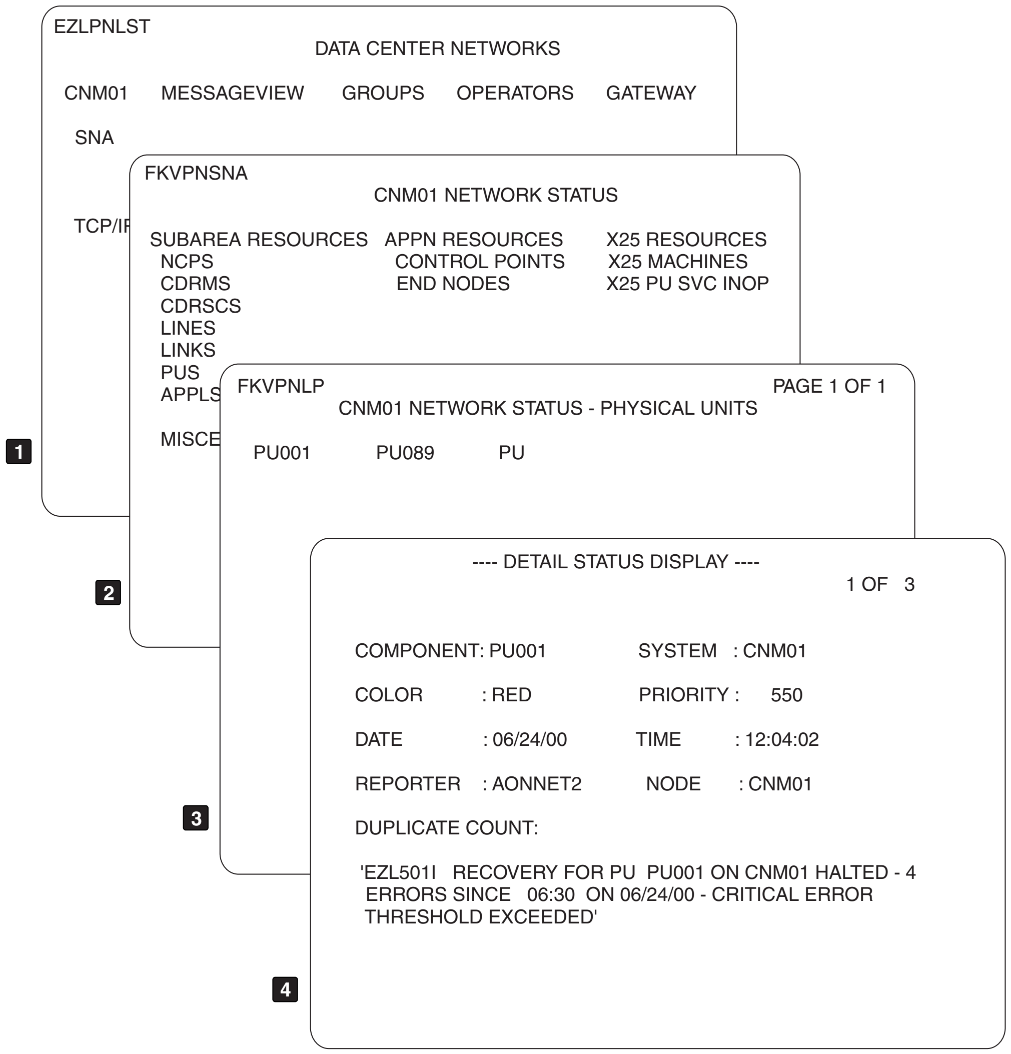
Understanding the Hierarchical Status Display

DDF uses colors to represent the status of various network resources. DDF can track the error, warning, action, or informational states of network resources. Although DDF can display the status of all network resources, you can tailor DDF to display only resources that have an error. This helps you focus on network problems rather than the entire network and save central processing unit (CPU) time.

DDF displays the status of resources (active or inactive). Each type of status is displayed in a different color. For example, inactive resources are red and active resources are green. For more information, see "Defining Default Colors for Status Components (EMPTYCOLOR)" on page 54.

You can tailor DDF to display the status of all resources of a particular type. If you use this design, DDF displays each resource type in a different color. For example, DDF might display a Network Control Program (NCP) problem in red and a line problem in pink. See "Displaying Network Status on a Single Panel" on page 75 for instructions about tailoring DDF to display by resource type.

DDF presents a hierarchical status display. Figure 5 on page 17 illustrates a sequence of sample SNA-specific DDF panels, moving from the domain to the resource level.



```
EZLPNLST
                         DATA CENTER NETWORKS

CNM01    MESSAGEVIEW     GROUPS    OPERATORS    GATEWAY

 SNA

 TCP/IP
```

```
FKVPNSNA
                      CNM01 NETWORK STATUS

SUBAREA RESOURCES   APPN RESOURCES      X25 RESOURCES
  NCPS                CONTROL POINTS     X25 MACHINES
  CDRMS               END NODES          X25 PU SVC INOP
  CDRSCS
  LINES
  LINKS
  PUS
  APPLS

  MISCE
```

```
FKVPNLP                                         PAGE 1 OF 1
          CNM01 NETWORK STATUS - PHYSICAL UNITS

  PU001        PU089        PU
```

```
                ---- DETAIL STATUS DISPLAY ----
                                                  1 OF   3


  COMPONENT: PU001           SYSTEM   : CNM01

  COLOR       : RED          PRIORITY :    550

  DATE        : 06/24/00     TIME      : 12:04:02

  REPORTER    : AONNET2      NODE      : CNM01

  DUPLICATE COUNT:

  'EZL501I   RECOVERY FOR PU  PU001 ON CNM01 HALTED - 4
   ERRORS SINCE   06:30  ON 06/24/00 - CRITICAL ERROR
   THRESHOLD EXCEEDED'
```

Figure 5. Sample DDF Panel Flow of SNA Resources

In Figure 5 you can see:

1 The Data Center Networks panel is the first DDF panel. In Figure 5, **SNA**, and **TCP/IP** represent the SNA and TCP/IP resources in the domain, CNM01. To see the types of SNA resources defined to CNM01, move the cursor to **SNA** and press the down key, **F8**.

2 All the monitored SNA resource types within network CNM01 are displayed on the CNM01 Network Status panel. To see the names of the physical units defined to CNM01, move the cursor to **PUS** and press the down key, **F8**.

3 The next panel shows the names of the physical units that are experiencing problems. DDF shows each monitored resource in the color of its status. For example PU001 is shown in red if the status is INACTIVE, which requires operator intervention for recovery. To see the detail record, move the cursor to **PU001** and press the Detail key, **F2**.

4 The status details record for PU001 is shown on the Detail Status Display. The physical unit PU001 requires operator intervention because a critical threshold has been reached and automation has stopped.

When you select a problem for analysis, press **F2** (the DDF MARK command) to inform others that you are working on the problem. Also, before you resolve a problem, check DDF to determine whether someone is already working on the problem.

AON uses many different programs to update resource status in DDF regardless of the sequence or priorities posted by other programs. As AON automation resolves the problems, DDF removes the resources from the display.

Defining Dependencies

DDF uses tree structures to implement the hierarchical display of status information. A tree structure starts with the system name as the root node and a level number of 1. The leaves of the tree represent the monitored resources, and the level numbers reflect which resources depend on each other. DDF generic values can also represent the leaves. Figure 6 shows the tree structure provided with the AON/SNA component and includes member EZLTREE in the DSIPARM. This example also shows the order of dependency.

```
/* NETWORK: CNM01  */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SNA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
          6 EN
        5 X25
          6 X25MCH
```

Figure 6. DDF Tree Structure

Color in the tree structure is based on the order of dependencies. To consolidate the status of monitored network resources at the root node, specify the DDF parameter PROPAGATE UP. Figure 6 shows how DDF reflects any color changes for LINE on LINE, SNA, NETWORK, SYSTEM, and CNM01. The color of the root node reflects the most important or critical status in a network operations center. If all the monitored resources are green, or active and not displayed, DDF shows the root node in green on the Data Center Network panel.

Defining the Priority and Color of the Resources

If more than one panel of information is available, DDF places 1 of *n* field in the upper right corner of the first Detail Status Display. On any series of detail status displays, DDF displays the most critical status color first. If more than one display has the same status color, DDF displays the most recent first.

Figure 7 shows three of these panels. This example shows that DDF has fourteen status display panels.

```
           ---- DETAIL STATUS DISPLAY ----
                                                   2 OF   14


 COMPONENT: LINE1                SYSTEM   : CNM01

 COLOR    : PINK                 PRIORITY :      260

 DATE     : 06/24/00             TIME     : 12:59:07

 REPORTER : AONNET1              NODE     : CNM01

 DUPLICATE COUNT:

  EZL506I  LINE LINE1 ON CNM01 INACTIVE - RECOVERY MONITORING
           HAS BEEN INITIATED
```

```
           ---- DETAIL STATUS DISPLAY ----
                                                   6 OF   14


COMPONENT: MK34RSCS              SYSTEM   : CNM01

COLOR    : TURQUOISE             PRIORITY :      460

DATE     : 06/24/00              TIME     : 12:58:41

REPORTER : AONNET1               NODE     : CNM01

DUPLICATE COUNT:

 EZL507I REMINDER: CDRSC MK34RSCS ON CNM01 HAS BEEN UNRECOVERABLE
         FOR 1 MIN.
```

```
           ---- DETAIL STATUS DISPLAY ----
                                                   8 OF   14


COMPONENT: EZLAPPL               SYSTEM   : CNM01

COLOR    : GREEN                 PRIORITY :      900

DATE     : 06/24/00              TIME     : 12:19:13

REPORTER : AUTO1                 NODE     : CNM01

DUPLICATE COUNT:

 AON INITIALIZATION ENTRY FOR RESOURCE TYPE APPL
```

Figure 7. Sample Detail Status Displays

In Figure 7, notice that the pink and turquoise panels precede the green status panel. During DDF initialization, DDF assigns colors to specific priority ranges as defined in DSIPARM member EZLINIT. DDF orders Detail Status Displays by priority and assigns the following priority ranges to these colors:

Red	Priority 100 to 199
Pink	Priority 200 to 299
Yellow	Priority 300 to 399
Turquoise	Priority 400 to 499
Green	Priority 500 to 599

When a new status is added, DDF issues a DDFADD command with the appropriate priority. For example, when the status descriptor with the priority 350 is added DDF displays yellow.

Status descriptors are connected to the status component in ascending order of priority. Therefore, if DDF assigns two status descriptors for PU with priorities of 120 and 150, DDF displays the one with the priority of 120 first. The PU is displayed in red. If a status component has multiple status descriptors with equal priorities, the status descriptors are chained off the status component in order of arrival time. Use the DDFDEL command to delete status descriptors.

Updating Status

To define the status and types used to set priority and color, place the definitions in the control file. When an automation event occurs, AON logging routines scan the control file for the DDF entry for that status or type. DDF uses the information from the control file and issues a DDFADD request. Table 3 shows the status, color, and priority as provided with the AON base control file entries. The TCP/IP components add more DDF status types.

Table 3. Examples of DDF Status Defaults (EZLCFGDS)

Resource Status	Color Defaults	Priority
ACT*	GREEN+	550
CON*	GREEN+	550
IIN*	RED	160
INA*	RED	150
INO*	RED	160
NEV*	YELLOW	360
PAC*	PINK	260
PCT*	PINK	260
UP	GREEN+	550
STOP	RED	150
RES*	TURQUOISE	460
RCV*	GREEN	550
REAC*	PINK	270

Note:
+ Indicates that the status of resources with the default of green display with a REQ=NOADD option.

If the DDF status contains a CLEAR=Y, REQ=NOADD, and DDF posts a resource at that status, DDF removes the existing descriptor and does not add the new descriptor. Thus, DDF no longer displays the resource name.

If DDF uses resource status for color determination, code both Virtual Telecommunications Access Method (VTAM) status and automation status. Use wildcard characters to reduce the number of entries required. The NETSTAT command for DDF update uses VTAM status when you define DDFREFRESH as Y in the ENVIRON SETUP DDF control file. The current network status output from NETSTAT primes DDF.

Dynamic Updates

DDF uses automation status for dynamic updates during network automation activity. If you define the NETSTAT CHKAUTO parameter as Y, AON checks the automation flags for the resource before adding them to DDF. If this check determines that automation is off for the resource, DDF does not add the resource.

For example, when DDF sets PU001 to an INACTV state, the logging routines scan the control file for the INA* entry for DDF and generate a DDFADD request with a priority of 150. PU001 is displayed in red on the DDF status panel. After DDF sets PU001 to an ACTIVE state, the logging routines scan the control file for the active state DDF entry and generate a DDFDEL request. DDF then deletes PU001 from the DDF status panel.

Problem Resources

If a program detects a warning message for LINE02 on CNM01, DDF issues a DDFADD command to add a status descriptor for LINE02. The status display for LINE02 on system CNM01 now indicates a problem with LINE02. If you specify the DDF PROPAGATE UP parameter, the CNM01 field also reflects this.

Occasionally, a more serious problem might arise. The routine that detects this problem updates DDF with a status descriptor of a lower priority number. Because DDF links status descriptors in order of priority, the LINE02 status now reflects the status descriptor color of the more serious problem. After you resolve the more serious problem, the program detecting the resolution of the problem issues a DDFDEL command to remove LINE02 from the display.

Defining Status Panels

AON defines DDF status statements for status panels, in the CNMPNL1 data set and embeds the definitions in the EZLPNLS member with %INCLUDE. However, the DDF formats and internally builds the Detail Status Display.

If you define status components in the panel definitions, also define them in the corresponding tree structure. However, not all the status components defined in the tree structure require a corresponding entry on the Detail Status Display. In Figure 6 on page 18, the NETWORK status component is only a pseudo entry and is not defined on any DDF Detail Status Display.

You can customize the DDF status panels to reflect any environment. For example, you can define a panel to show the status of all the networks on all CPUs within the network operations center. The network operator then views the panel to determine the status of any of the network resources in the complex.

Defining Multiple Systems

You can define multiple NetView domains to DDF. You must first implement AON focal-point services for the target system DDF status update on the focal-point DDF. For more information on focal-points, refer to *IBM Tivoli NetView for z/OS Administration Reference*.

In a multidomain environment, define a tree structure for each domain in the EZLTREE member of the DSIPARM data set on the designated focal-point DDF. Provide a unique root name for each systems tree structure, and match the focal-point root name with the ENVIRON SETUP SYSNAME entry in the control file. Also, code an entry for the SYSNAME parameter.

Because each root name is unique in a multiple systems environment, DDF uniquely addresses any status component on a system defined to the focal-point DDF. By adding the status component as a prefix to the root component name, DDF performs this addressing as the following example shows:

```
ROOT_COMPONENT.STATUS_COMPONENT (for example, CNM01.PU)
```

Similarly, AON routines add a prefix to DDF status descriptors shipped from the target system to the focal-point DDF with the root name of the target system.

Implementing DDF

When defining resources to DDF, you can explicitly define every network, gateway, domain, and resource in the DDF tree and panels. However, this technique has a disadvantage. As the number of resources tracked by AON increases, DDF maintenance grows more complex. To simplify this maintenance, AON provides a generic implementation of DDF that requires you to define only the group identifier, not the individual resources. For example, if you display resources using the generic definitions, the DDF tree requires only resource types. If you use this method, it is not necessary to define all network resources or all resource types known to this system (for example, to the PU level).

Using Generic Implementation

Generic implementation takes advantage of three functions within DDF:
- Storing detail records by priority
- Adding detail records using the default status component
- Displaying records using the status descriptor number

Use the default status component when a request to ADD, DELETE, or QUERY for the actual resource name fails. For example, if you add a component such as CNM01.PU001(RESOURCE) when PU001 is not in the tree, DDF attempts to add the component to the generic component of RESOURCE.

The relative position of the detail record in the detail record chain under a component determines the status descriptor number. Each component consists of detail records that were added directly to that component and all detail records with subordinate levels. For example, consider the following tree:

```
/*   SYSTEM: CNM01    */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 NETWORK
      4 RESOURCE
```

The DDFADD command for this tree is:

```
DDFADD CNM01.PU001(RESOURCE),IN=/PU001/
```

When you issue the DDFADD command, DDF adds the entry to the resource because PU001 is not defined in the tree.

When you request the detail records for the generic resource, DDF displays the detail records for all components added using the generic component RESOURCE and PU001. The DDFQRY command is:

```
DDFQRY CNM01.RESOURCE
```

Alternatively, you can code the panel like this:

```
SF(CNM01.RESOURCE,04,05,16,N, , ,nn)
```

When you request the detail records for NETWORK, DDF not only displays the detail records added directly to NETWORK as well as detail records added directly to generic component RESOURCE.

```
DDFQRY CNM01.NETWORK
```

Alternatively, you can code the panel like this:

```
SF(CNM01.NETWORK,04,05,16,N, , ,nn)
```

DDF arranges detail records in priority order under each component.

Complete the following steps to define your network to DDF using the generic component:

1. Define the generic components to the tree as the following example shows:

   ```
   1 CNM01
     2 SYSTEM
       3 NETWORK
         4 RESOURCE
   ```

2. Use the generic component in the tree to display the detail records at the specified positions on the panel. The empty status text field, coded as `ST( )`, causes DDF to display the INFO field of the DDFADD command for the detail record. If a descriptor with a descriptor number of 11 does not exist, DDF shows only 10 records and the status text field displays is empty.

   With this method, resources display in order of the priority of the condition of the resource. For example, if you use the DDF statements in the EZLCFG01 sample, DDF assigns the highest priority to red and the lowest to green. The following example shows a panel displaying a status of 12 network resources. This panel displays the highest priority error in the upper left position and the resources are listed in rows across the panel:

   ```
   /* DEFINE CNM01 NETWORK STATUS PANEL */
   P(EZLPNL1,24,80,SYSTEM,SYSTEM, , , )
   TF(01,27,57,WHITE,NORMAL)
   TT(CNM01 NETWORK STATUS)
   SF(CNM01.NETWORK,04,05,16,N, , ,01)
   ST( )
   SF(CNM01.NETWORK,04,25,36,N, , ,02)
   ST( )
   SF(CNM01.NETWORK,04,45,56,N, , ,03)
   ST( )
   SF(CNM01.NETWORK,04,65,76,N, , ,04)
   ST( )
   SF(CNM01.NETWORK,06,05,16,N, , ,05)
   ST( )
   SF(CNM01.NETWORK,06,25,36,N, , ,06)
   ST( )
   SF(CNM01.NETWORK,06,45,56,N, , ,07)
   ST( )
   SF(CNM01.NETWORK,06,65,76,N, , ,08)
   ST( )
   SF(CNM01.NETWORK,08,05,16,N, , ,09)
   ST( )
   ```

```
SF(CNM01.NETWORK,08,25,36,N, , ,10)
ST( )
SF(CNM01.NETWORK,08,45,56,N, , ,11)
ST( )
SF(CNM01.NETWORK,08,65,76,N, , ,12)
ST( )
TF(24,01,48,T,NORMAL)
TT(PF1=HELP 2=DETAIL 3=END 4=DIS 5=CY 6=ROLL 7=UP)
TF(24,51,79,T,NORMAL)
TT(       10=LF 11=RT 12=TOP)
EP
```

This technique gives you the advantage of first seeing the list of resources with the most critical problems. DDF determines resource panel position according to the order and priority of the problems. AON ships examples of components using this feature in the following members of CNMPNL1:

- EZLPNLS
- EZLPNLTY
- EZLPNLST
- EZLPNL1
- FKVPNL21

With DDF you can define generic values for your environment. Multiple generic values can apply to one message added to DDF to help organize network data in DDF. For example, you can test the RESTYPE message processing field to see whether it contains a valid generic value for DDF on this system. AON checks the ENVIRON DDF DDFGENERIC statements in the control file to verify generic values.

The DDFGENERIC RESTYPE VALUE=(*restype*,...) statement defines valid generic values in the control file. Samples provided with AON categorize DDF by resource type. For each valid generic value, define a panel which can display status descriptors added under this generic. In this case, `SF (CNM01.PU,04,05,16,N,...)` displays components for the PU generic. `SF(CNM01.NETWORK,14,05,16,N,...)` also displays components for the PU generic because the tree hierarchy shows that NETWORK is higher than PU.

Specific Implementation of DDF

If you define your network to DDF with the specific method, DDF displays resource names in a fixed position on the DDF panels. When DDF records a detail record for the resource, a resource name changes color. When no detail records exist for the resource, DDF shows the resource name in the status text field as blue, which is considered an empty color.

Note: When using the specific implementation of DDF, do not use REQ=NOADD in any DDF status definition in the control file.

Because large networks require excessive effort and storage to define and maintain in DDF, reserve specific implementation for small networks.

Complete the following steps to define your network to DDF using the specific component:

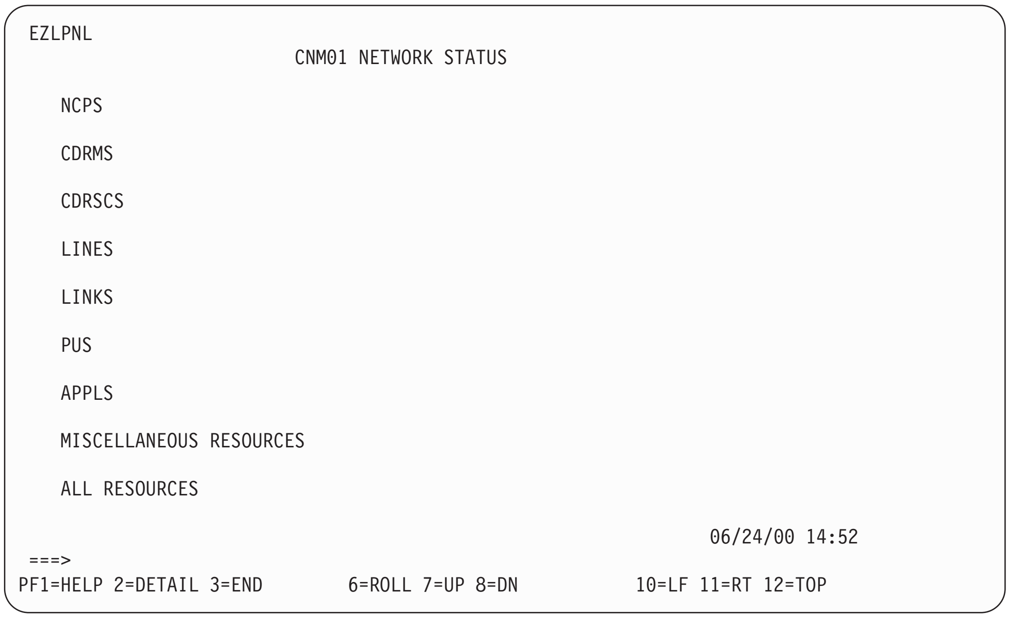
1. Define resources to the tree as shown in the following example:

```
/*   NETWORK: CNM01
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 NETWORK
      4 RESOURCE
      4 NCP01
      4 LINE01
      4 LINE02
      4 PU001
      4 PU02
      4 630-S
```

2. Define resources to the panel as shown in the following example:

```
/* DEFINE CNM01 NETWORK STATUS PANEL */
P(EZLPNL,24,80,SYSTEM,SYSTEM, , , )
TF(01,27,47,WHITE,NORMAL)
TT(CNM01 NETWORK STATUS)
SF(CNM01.NCP01,04,05,16,N, ,)
ST(NCP01)
SF(CNM01.LINE01,06,05,16,N, ,)
ST(LINE01)
SF(CNM01.LINE02,08,05,16,N, ,)
ST(LINE02)
SF(CNM01.PU001,10,05,16,N, ,)
ST(PU001)
SF(CNM01.PU02,12,05,16,N, ,)
ST(PU02)
SF(CNM01.630-S,14,05,16,N, ,)
ST(630-S)
TF(24,01,48,T,NORMAL)
TT(PF1=HELP 2=DETAIL 3=END        6=ROLL 7=UP 8=DN)
TF(24,51,79,T,NORMAL)
TT(9=DEL   10=LF 11=RT 12=TOP)
EP
```

If you define the code as shown in the previous example, the DDF panel is similar to Figure 8. The resources are hard coded on the panel, so they are displayed at all times regardless of the status of the resources. This implementation differs from the default DDF implementation, which displays only resources with an exception status.



```
 EZLPNL
                       CNM01 NETWORK STATUS

    NCPS

    CDRMS

    CDRSCS

    LINES

    LINKS

    PUS

    APPLS

    MISCELLANEOUS RESOURCES

    ALL RESOURCES

                                                          06/24/00 14:52
 ===>
PF1=HELP 2=DETAIL 3=END        6=ROLL 7=UP 8=DN           10=LF 11=RT 12=TOP
```

Figure 8. Sample Panel Using Specific Implementation of DDF

Defining the Contents of DDF

Table 4 shows the elements that comprise DDF:

Table 4. Defining DDF Contents

Name	Type	Purpose
EZLTDDF	Task	Initializes DDF and maintains status information.
DDF	Command	Enters a DDF operator session.
DDFADD	Command	Adds status information.
DDFDEL	Command	Deletes status information.
DDFQRY	Command	Queries information.
DDFTREE	Command	Dynamically loads a tree member from the DSIPARM data set.
DDFPANEL	Command	Dynamically loads a panel member from the CNMPNL1 data set.
EZLINIT	Input file	Contains the initialization parameters defined with the statements described in "Defining Initialization Statements (EZLINIT)" on page 39. The EZLINIT member is in the DSIPARM data set.
EZLTREE	Input file	Contains the tree structures as described in "Defining the Panel Hierarchy (EZLTREE)" on page 36. This member can consist of a list of %INCLUDE statements that reference other members that contain tree structures. The format is %INCLUDE *member*, where *member* is the name of the member to include. The EZLTREE member is in the DSIPARM data set.
EZLPNLS	Input file	Contains the DDF panel parameters defined with the statements described in "Defining the Panel Statements (EZLPNLS)" on page 57. This member can consist of a list of %INCLUDE statements that reference other members that contain panel definitions. The format is %INCLUDE *member*, where *member* is the name of the member to include. EZLPNLS is in the CNMPNL1 data set.
panel_name	Input file	Contains the definition of a single panel. Name the member the panel name as defined with the PANEL statement.
tree_name	Input file	Contains the definition of a single tree structure. Name the member the root component name.
DDF	Control file entry	Defines status priority.
ENVIRON DDF	Control file entry	Defines DDF setup defaults for the system.
DDFGENERIC	Control file entry	Defines valid values for implementing a generic set of values for DDF.

Starting and Stopping DDF

During AON initialization, the EZLTDDF task loads the members that define panel format, navigation, and tree structures. The EZLINIT member defines parameters that are common to all DDF panels as well as basic initialization specifications such as the screen size, default function keys, and the initial screen displayed when a DDF session starts.

The EZLPNLS member defines parameters unique to specific panels, and the EZLTREE member defines the tree structures. These two members consist of either tree structure and panel definitions for all DDF panels or %INCLUDE statements that point to members containing definitions of single panels or tree structures.

Using %INCLUDE statements enables you to reload all definition members besides EZLINIT, EZLTREE, and EZLPNLS without the DDFADD command. For more information, see “Loading Panels” and “Loading Tree Structures.” To change panels or tree structure specifications defined in the EZLTREE and EZLPNLS members, stop DDF and restart it to load the new definitions.

To start DDF, issue one of the following commands from a NetView console:
- STARTEZL DDF
- START TASK=EZLTDDF

To stop DDF, issue one of the following commands from a NetView console:
- **STOPEZL DDF**
- STOP TASK=EZLTDDF

When you stop DDF, it loses all existing status descriptors because the computer stores them only in memory. If you define DDFREFRESH=YES in the ENVIRON SETUP statement of the EZLCFG01 member, you can use the NETSTAT command to access VTAM displays and to prime DDF with current network exception conditions when it initializes. If you do not set DDFREFRESH to YES, DDF updates the file when it detects new failures, and then processes and logs the MONIT intervals.

Loading Panels

Without restarting DDF, you can dynamically load panels using either of the following two methods:
- Use the DDFPANEL command. For more information about the DDF panel command, see the following section, “Loading Tree Structures” and “Loading a Panel Member (DDFPANEL)” on page 106.
- Use the PANEL statement. The PANEL statement parameters search for a panel that is not defined in the EZLPNLS member. DDF locates a member in the CNMPNL1 data set with the same name as the requested panel name. For more information about the PANEL statement and its parameters, see “Defining New Panels (PANEL)” on page 58.

Loading Tree Structures

To dynamically load tree structures with the DDFTREE command, a member must exist in the DSIPARM data set that is named the same as the panel name or the root component in the tree structure. DDF makes the panels loaded with the DDFPANEL command resident only. All others are loaded when an operator issues commands that calls for them. DDF does not use %INCLUDE statements.

For example, you can change the tree structure for the root component CNM01 and the panel named EZLPNL1. You can also define these elements in members other than the EZLTREE or EZLPNLS members. You can then use the following commands to load the new definitions:
- **DDFTREE EZLTREES,ADD**
- **DDFPANEL EZLPNL1,ADD**

These commands enable you to load a small number of panels during initialization and add or delete panel subsets when required. This can significantly decrease the number of panels that DDF recognizes at any one time.

When DDF loads a new tree and replaces the existing tree, DDF copies status descriptors with similar leaf names, in both trees, to the new tree. For more information, see "Loading Tree Members (DDFTREE)" on page 109.

Using the Definition Procedure

When you start a DDF session, use the following procedure to define the panels that DDF displays:

1. Define the component hierarchy as described in "Defining the Panel Hierarchy (EZLTREE)" on page 36. The EZLTREE tree contains tree structure definitions. Perform either or both of the following procedures:
   - Place all tree structure definitions in this member.
   - Use %INCLUDE statements to point to other members that contain definitions for entire tree structures.

   If you use %INCLUDE statements when you add and delete trees, use the same name for referenced members and the root component. Complete the trees, starting at level 1. DDF deletes trees by the root name and adds them by the DSIPARM member name.

   To load some tree structures during initialization and after DDF is started use the EZLTREE member to define those tree structure entries that you load during initialization. Then, use the DDFTREE command to load additional tree structures as needed. After you start DDF, put the tree structures in separate members. Name each member after the root component for which you define the tree structure.

   The following example shows a typical tree structure definition for AON/SNA:

```
/*   NETWORK : CNM01                                               */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
      6 EN
    5 X25
      6 X25MCH
      6 X25PU
```

In the preceding example, CNM01 is the root component. Embed this definition in the EZLTREE member or in a separate member named CNM01. "Defining the Panel Hierarchy (EZLTREE)" on page 36 describes tree structures in detail.

Define the initialization and common panel specifications as described in "Defining Initialization Statements (EZLINIT)" on page 39. The EZLINIT member defines parameters that are common to all DDF panels and basic initialization specifications such as:

- Screen size
- Initial screen shown when you start the DDF session
- Maximum operator logon limit
- Temporary error limit value
- Default function key definitions
- Detail function key definitions
- Detail function key descriptions
- Default priorities and colors

Define the panels as described in "Defining the Panel Statements (EZLPNLS)" on page 57. After you initialize DDF, use the EZLPNLS member to load the panel definitions. This member can contain the following:

- Definitions for all panels.
- %INCLUDE statements that point to separate members containing panel definitions.
- Combination of both panel definitions and %INCLUDE statements.
- Subset of panel entries that are loaded during initialization so that you can load additional panel definitions when needed. For more information, see "Loading Panels" on page 27.

The default 3270 screen size for DDF is 24 rows by 80 columns. The VTAM LOGMODE used for any DDF (NetView) 3270 work station must specify the default screen size of 24 x 80. The alternate screen size in the LOGMODE can specify any size supported by NetView. DDF uses the 3270 command Erase/Write to present its screens to the user, which uses the default screen size specified in the LOGMODE.

The following example shows a typical menu panel definition named EZLPNLST. Embed this definition in the EZLPNLS member or in a separate member named EZLPLNST.

```
P(EZLPNLST,24,80, , , , , )
TF(01,02,09,T,NORMAL)
TT(EZLPNLST)
TF(02,25,57,WHITE,NORMAL)
TT(DATA CENTER NETWORKS)
SF(CNM01.NETWORK,04,05,10,N, ,EZLPNL2)
ST(CNM01)
SF(CNM01.SYSTEM,04,17,30,N, ,EZLPNLO1)
ST(MESSAGEVIEW)
SF(CNM01.GROUPS,04,35,40,N, ,EZLPNLGR)
ST(GROUPS)
SF(CNM01.OPID,04,48,57,N, ,EZLPNLW0)
ST(OPERATORS)
SF(CNM01.GATEWAY,04,65,72,N, ,EZLPNLG)
ST(GATEWAY)
TF(24,01,48,T,NORMAL)
TT(PF1=HELP 2=DETAIL 3=END        6=ROLL 7=UP 8=DN)
TF(24,51,79,T,NORMAL)
TT(        10=LF 11=RT 12=TOP)
PFK4()
PFK5()
PFK9()
EP
```

Figure 9. Menu Panel Definition

Table 5 provides a description for each statement in the preceding example.

Table 5. Menu Panel Definitions

Statement and Description
`P(EZLPNLST,24,80, , , , , )` This is the panel definition statement. The panel name is EZLPNLST, the length of the panel is 24, and the width of the panel is 80.
`TF(01,02,09,WHITE,NORMAL)` This is the text location statement used to define constant panel fields. This field starts on line 01, in position 02, and ends in position 09. The color of the field is white and the highlighting is normal.
`TT(EZLPNLST)` The text data statement (EXLPNLST) that specifies data that goes in the field just defined.
`TF(01,25,57,WHITE,NORMAL)` Text location statement for another constant field.
`TT(DATA CENTER NETWORKS)` Text data statement for the field just defined. Notice that TF and TT are grouped in pairs.
`SF(CNM01.NETWORK,04,05,10,N, ,EZLPNL2)` This statement defines the location of the status component field. The status component is CNM01, this field starts on line 04 in position 05 and ends in position 10. The highlight level is normal, and the next panel displayed when **F8** (Down) is pressed is EZLPNL2.
`ST(CNM01)` This text is displayed in the SF field. The field name is CNM01. Notice also that SF and ST are grouped in pairs.
`SF(CNM01.SYSTEM,04,17,30,N, ,EZLPNLO1)` Status field definition.

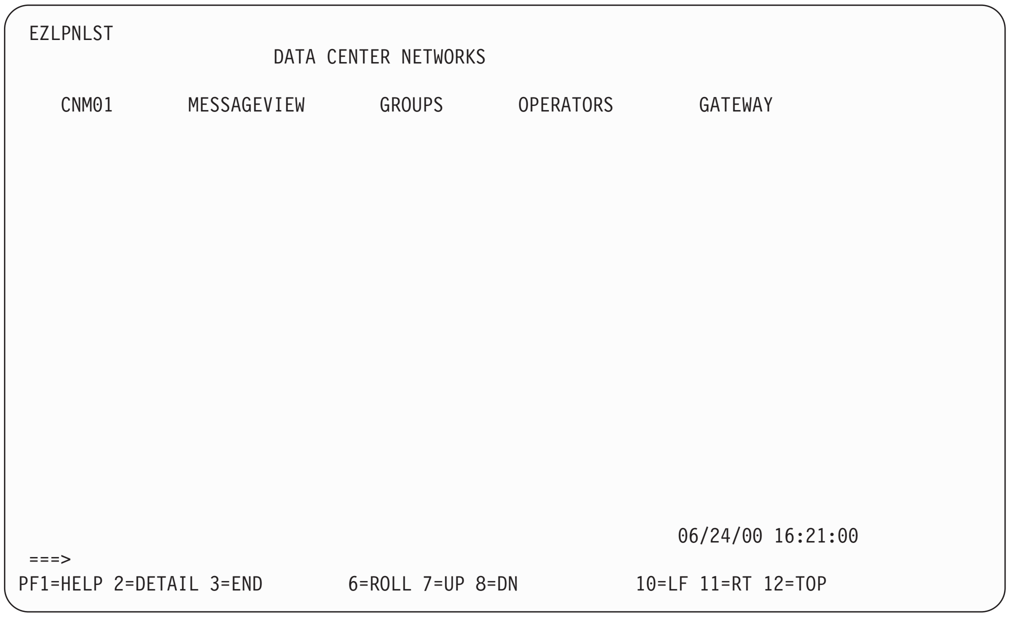
Table 5. Menu Panel Definitions (continued)

Statement and Description
`ST(MESSAGEVIEW)` Status text definition.
`SF(CNM01.GATEWAY,04,65,72,N, ,EZLPNLG)` Status field definition.
`ST(GATEWAY)` Status text definition.

`TF(24,01,39,T,NORMAL)`
`TT(1=HELP 2=DETAIL 3=RET  6=ROLL  8=DN)`
`TF(24,40,79,T,NORMAL)`
`TT(10=LF 11=RT    12=TOP)`
 	
Here, TF and TT are used to display the function key definitions, which these are the defaults defined in EZLINIT. You can define function keys unique to this panel.

`EP` This is the end panel statement used to indicate that this is the end of definitions for this panel.

Figure 10 shows the panel that is displayed when you run the statements listed in Table 5 on page 30.



```
 EZLPNLST
                     DATA CENTER NETWORKS

    CNM01       MESSAGEVIEW       GROUPS       OPERATORS       GATEWAY




















                                                                   06/24/00 16:21:00
 ===>
PF1=HELP 2=DETAIL 3=END       6=ROLL 7=UP 8=DN          10=LF 11=RT 12=TOP
```

Figure 10. Data Center Networks (EZLPNLST) Panel

Modifying the Control File for DDF

The EZLCFG01 sample control file requires minimal changes to set up DDF. You must, however, customize the definition of your NetView domain. Customize ENVIRON SETUP SYSNAME=CNM01 to reflect the system name you choose for AON. Use the NetView domain ID. The value is referred to as the SYSNAME in this document. The SYSNAME value is used during panel and tree installation.

In the sample implementation, the ENVIRON DDF statement is defined as follows:

```
ENVIRON DDF DDF=STATUS,DDFREFRESH=NO,DDFGENERIC=(RESTYPE),DDFAUTO=NO
```

Where:

DDF=STATUS
: Causes the resource status to determine the color of the indicators in DDF.

DDFREFRESH=NO
: Causes DDF to not be taken from current VTAM status only at DDF initialization. In some networks, the displays required to do this can cause an increase in CPU usage during initialization. If you want to do this, change this definition to DDFREFRESH=YES.

DDFGENERIC=(RESTYPE)
: Causes DDF to group the resource status descriptors and display them by resource type.

DDFAUTO=NO
: Causes DDF to display status changes for the resources regardless of whether the automation flag is on. If you do not want failures of non-automated resources posted to DDF, change this definition to DDFAUTO=YES.

Other control file definitions that influence DDF are the DDF and DDFGENERIC statements. Use the AON defaults for these definitions.

Modifying the EZLTREE Tree Structure

Tree structures define resources into hierarchical groups, with the domain as the highest component in the hierarchy.

The sample tree provided with AON enables DDF to display current problems in your networking environment, with minimal maintenance. Change domain CNM01 in the EZLTREE member to reflect your SYSNAME value (domain ID).

Modifying DDF Panels

The sample panels copied into the CNMPNL1 data set during installation set up a typical implementation of DDF. To activate DDF, edit the following panels, changing all occurrences of CNM01 to your domain ID (SYSNAME value on ENVIRON SETUP statement):

EZLPNLG	EZLPNLG1	EZLPNLL
EZLPNLOA	EZLPNLOB	EZLPNLO1
EZLPNLO2	EZLPNLST	EZLPNLTY
EZLPNL1	EZLPNL2	

If you want to use the sample DDF group, you need to change the domain ID in the following panels:

EZLPNLGR	EZLPNLLA	EZLPNLNY
EZLPNLSD	EZLPNLSF	EZLPNLAT
EZLPNLCA	EZLPNLC1	

To use the same operator signout panels, change the domain ID in the following panels:

EZLPNLW0	EZLPNLW1	EZLPNLW2

Adding AON/TCP and SNA to the Main DDF Panel

Complete the following sections to add the AON components to the main DDF panel.

Adding TCP to the Main DDF Panel

To display a TCP/IP selection on the main DDF panel, do one of the following:

- If you are using the EZLPNLST member as your main DDF panel (the first panel to display), add the following statements:

  ```
  SF (CNM01.TCPIP,10,10,17,N, ,FKXPNLT)
  ST (TCPIP)
  ```

  These statements are also in the FKXPNLST data set and you can copy them from there.
- If you are using the EZLPNLTY panel as your main DDF panel, add the following statements:

  ```
  SF (CNM01.TCPIP,10,10,17,N, ,FKXPNLT7)
  ST (TCPIP)
  ```

  These statements are also in the FKXPNLTY data set and you can copy them from there.

Note: Remember to update CNM01 to your domain ID.

Adding SNA to the Main DDF Panel

To use AON/SNA, add AON/SNA to the main DDF panel by doing one of the following:

- If you are using the EZLPNLST panel as your main DDF panel (the first panel to display), add the following statements:

  ```
  SF(CNM01.NETWORK,06,10,15,N, ,FKVPNSNA)
  ST(SNA01)
  ```

  These statements are also in the FKVPNLST data set and you can copy them from there.
- If you are using EZLPNLTY as your main DDF panel, add the following statements:

  ```
  SF(CNM01,NETWORK,06,10,15,N, ,FKVPNL1)
  ST(SNA)
  ```

  These statements are also in the FKVPNLTY data set and you can copy them from there.

Editing EZLPNLS

To customize the panel list, copy the following members into the bottom of EZLPNLS:

- FKXPNLS (TCP)
- FKVPNLS (SNA)

Chapter 3. Defining Dynamic Display Facility (DDF) Statements

Table 6 lists the members where Dynamic Display Facility (DDF) statements are defined. This figure also explains the purpose of each member and shows where to find more information about each member.

Table 6. Members Containing DDF Statements

Member	**Purpose**	**Location of Heading**
EZLTREE	Defines panel hierarchy	"Defining the Panel Hierarchy (EZLTREE)" on page 36
EZLINIT	Defines initialization statements	"Defining Initialization Statements (EZLINIT)" on page 39
EZLPNLS	Defines panel statements	"Defining the Panel Statements (EZLPNLS)" on page 57
EZLCFG01	Defines generics and status color relationships.	Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information.

Defining the Panel Hierarchy (EZLTREE)

Purpose

The hierarchy for status color changes are defined in the EZLTREE member in the DSIPARM data set. When the status changes for a component, the corresponding color change extends up or down the tree to the higher or lower-level components. The level number assigned to each component determines the level. The entry in the EZLINIT member or the individual DDFADD command requests determines the type of propagation.

The following syntax diagram shows the level number entry.

Syntax

level_number

```
►►──level_number──status_component──┬───────────────────┬──┬─────────────────┬──►◄
                                    └─,empty_chain_color─┘  └─%INCLUDEmember──┘
```

Parameters

level_number
: Defines a valid number between 1 and 99. A tree starts with a root level of 1.

status_component
: Defines the resource for which status information is displayed. AON uses the resource name as defined in the control file. The status component entry for the root matches the ENVIRON SETUP SYSNAME entry in the control file.

empty_chain_color
: Defines a color for the empty chain. You can use red, blue, turquoise, pink, green, yellow, or white. If DDF does not associate a status descriptor with a status component, the status component is displayed in this color on the DDF status panel. This entry is optional and can also be coded in the EMPTYCOLOR entry of the EZLINIT member. See "Defining Default Colors for Status Components (EMPTYCOLOR)" on page 54 for more details.

%INCLUDE *member*
: Includes members that contain EZLTREE statements, where *member* is the member name. Each included member must start with level 1 and must contain an entire tree structure.

Usage

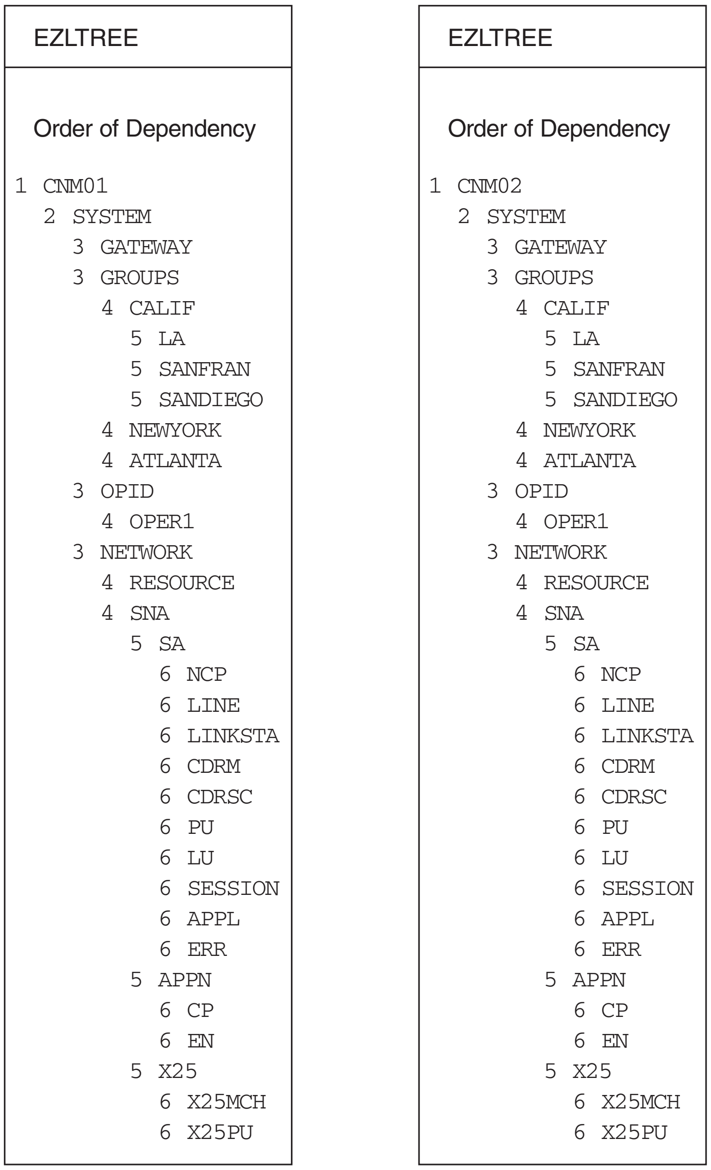
The level numbers define the order of dependence. For an example, see Figure 11 on page 37. In that figure, NCP is defined to be dependent on NETWORK. Therefore, when a change occurs for an NCP, it is reflected on NCP, NETWORK, SYSTEM, and CNM01.

You cannot use duplicate status components within the same tree. Not all status components that are defined in the tree need to have a corresponding panel entry or a status descriptor associated with them. Each root name must be unique to avoid addressing conflicts. DDF can address each status component defined in the tree as follows:

```
root_component.status_component
```

Example

Two separate AON/SNA trees, CNM01 and CNM02, representing two different networks are defined Figure 11. In this example, CNM01 is the focal point and CNM02 is the remote domain. In the EZLTREE member on CNM01, define a tree for both CNM01 and CNM02.



```
EZLTREE

Order of Dependency

1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
          6 EN
        5 X25
          6 X25MCH
          6 X25PU
```

```
EZLTREE

Order of Dependency

1 CNM02
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
          6 EN
        5 X25
          6 X25MCH
          6 X25PU
```

Figure 11. DDF Tree Structure

Both trees start with level number 1 and each has a unique root name. They can have similar status component names, such as LINE, PU, and NCP. The corresponding entry for the root component in the control file on system CNM01 is:

```
ENVIRON SETUP,
       NETVIEW=NET,
       SYSNAME=CNM01,
```

⋮

Do not define the root component name CNM02 on the ENVIRON SETUP SYSNAME keyword in the control file for CNM01. Instead, define it in a similar way in the ENVIRON SETUP SYSNAME keyword in the control file for CNM02. Assuming that AON notification forwarding is established between CNM02 and CNM01, DDF adds a CNM02 prefix to all status components when status information is forwarded to CNM01. For example, it adds `CNM02.PU01 for PU01`. The EZLTREE member in the CNM02 system contains only the tree for CNM02.

Defining Initialization Statements (EZLINIT)

The EZLINIT member in the DSIPARM data set defines the DDF initialization parameters. You should use the defaults supplied in the EZLINIT member in DSIPARM.

Defining the Screen size (SCREENSZ)

Purpose

The SCREEN SIZE parameter defines the screen buffer size. This entry is optional. If you do not specify this parameter, AON uses a program default value of 3000.

The following syntax diagram show the screen size parameter.

Syntax

SCREENSZ

```
▶▶──┬──────────────────────────┬──────────────────────────────────────────▶◀
    │            ┌─3000───┐    │
    └─SCREENSZ=──┴─number─┴────┘
```

Parameters

number
Values can be in the range of 3000–9999.

Usage

For a larger screen buffer size, increase the *number* parameter.

Example

```
SCREENSZ = 4000
```

Linking the Chain Detail Records (CHAIN)

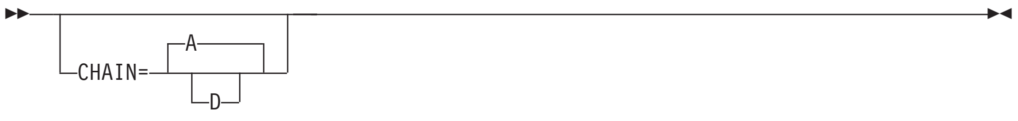
Purpose

The CHAIN parameter defines whether the detail status is linked in descending order (last to most recent) or in ascending order (most recent to last).

The following syntax diagram shows the chain parameter.

Syntax

CHAIN



Parameters

A Link detail records within the same priority in ascending order.
D Link detail records within the same priority in descending order.

Example

```
CHAIN = A
```

Defining the Initial Screen (INITSCRN)

Purpose

The INITSCRN parameter defines the initial panel that is displayed by DDF.

Syntax

INITSCRN

```
►►──INITSCRN=panel─────────────────────────────────────────────────────►◄
```

Parameters

panel
A valid alphanumeric name with maximum length of 8 characters.

Usage

If you change the initial panel as defined in the EZLPNLS member of the DSIPARM data set, also change the name in the INITSCRN entry.

Example

```
INITSCRN = EZLPNLST
```

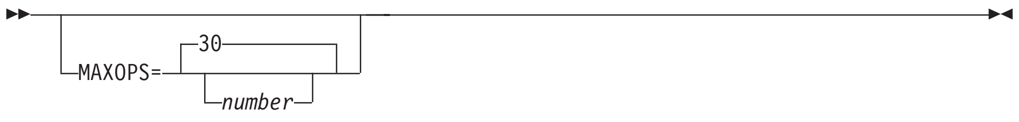
Defining the Number of Operators (MAXOPS)

Purpose

The MAXOPS parameter defines the maximum number of logged on operators that can use DDF. This entry is optional. If you do not specify this parameter, the default is 30.

Syntax

MAXOPS



Parameters

number
: Values range from 1 to 99.

Usage

If the number of operators attempting to use DDF is more than the number defined in the MAXOPS parameter, AON denies the additional operators access to DDF. The dynamic update facility keeps an internal count of the operators that are logged on.

Example

```
MAXOPS = 35
```

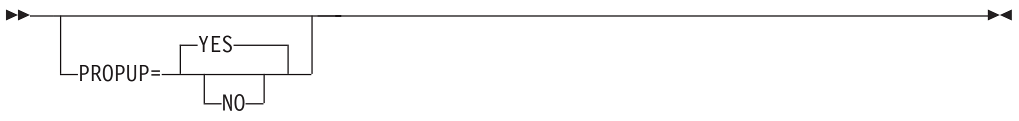
Propagating Status Upward (PROPUP)

Purpose

The PROPAGATE UP parameter defines whether status word text is sent up the status tree as a system default. This entry is optional. If you do not specify this parameter, the default is YES.

Syntax

PROPUP



Usage

Specify a value of YES. This parameter can be overridden with individual DDFADD requests. See “Adding Status Descriptors (DDFADD)” on page 99 for more information.

Propagating Status Downward (PROPDOWN)

Purpose

The PROPAGATE DOWN parameter defines whether status information is sent down the status tree as a system default. If you do not specify a value, the default is NO. This entry is optional.

Syntax

PROPDOWN

```
►►─┬──────────────────────┬────────────────────────────────────────►◄
   │            ┌─NO──┐   │
   └─PROPDOWN=──┴─YES─┴───┘
```

Usage

Specify a value of NO. This parameter can be overridden with individual DDFADD requests. See "Adding Status Descriptors (DDFADD)" on page 99 for more information. This entry is optional. If not coded, the default is NO.

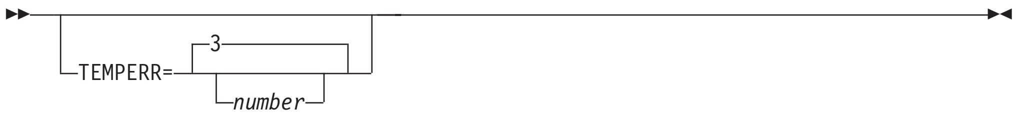
Defining the Temporary Error Limit (TEMPERR)

Purpose

The TEMPERR parameter defines the maximum number of temporary input and output errors you can receive when trying to display a DDF panel. This entry is optional. If you do not specify a value, the default is 3.

Syntax

TEMPERR



Parameters

number
  Values range from 3 to 99.

Usage

Use the value 5, which is provided in EZLINIT member in the DSIPARM data set.

Example

```
TEMPERR = 5
```

Defining the Default Function Key Definitions (PFKnn)

Purpose

The PFK*nn* parameter defines the default function key settings. You cannot change F3.

Syntax

PFK

```
►►──PFKnn=command var──────────────────────────────────────────────────►◄
```

Parameters

nn Values range from 1 to 24.

command
The command is issued when the function key is pressed.

var
A variable or any text data passed with this command. Use the following variables as part of the command:

&COMP
Identifies the component.

&COMPAPPL
Identifies the generic component within parentheses (for example, PU01(PU)). The generic component is shown only if the component was added using one.

&ROOT
Identifies the root or system.

&SYSDATE
Identifies the system date.

&SYSTIME
Identifies the system time.

&IN or &INFO
Identifies the detail entry word text that is displayed on the status screen.

&DATE
Identifies the date that the detail entry was added.

&TIME
Identifies the time that the detail entry was added.

&SENDERID
Identifies the reporter who submitted the detail entry.

&SNODE or &SENDERNODE
Identifies the node of the reporter who submitted the detail entry.

&DA or &DATA
Identifies the actual message text.

&RV or &REFVALUE
Identifies the reference value of the detail entry.

&PR or &PRIORITY
Identifies the priority of the detail entry.

&CO or &COLOR
Identifies to the color of the detail entry.

&HI or &HIGHLITE
Identifies the highlight level of the detail entry.

Usage

You can redefine all of the function keys except F3.

Example

In this example, the `DIS PU01` command is issued when F4 is pressed while the cursor is placed on the PU01 entry on the status screen:

```
PF4=DIS &INFO
```

Defining the Detail Function Key for the Detail Display (DPFKnn)

Purpose

The DPFK*nn* parameter defines the function keys that are unique to the detail panel.

Note: The function keys defined are active only when the detail panel is displayed and, therefore, override the default settings defined with the PFK*nn* statement.

Syntax

DPFK

```
▶▶──DPFKnn=command var──────────────────────────────────────────────▶◀
```

Parameters

nn Values range from 1 to 24.

command
The command issued when the defined function key is pressed.

var
The variables passed along with the command when the defined function key is pressed.

The following variables can be used as the command:

&COMP
Identifies the component.

&COMPAPPL
Identifies the generic component within parentheses (for example, PU01(PU)). The generic component is shown only if the component was added by using the value of 1.

&ROOT
Identifies the root or system.

&SYSDATE
Identifies the system date.

&SYSTIME
Identifies the system time.

&IN or &INFO
Identifies the detail entry word text that is displayed on the status panel.

&DATE
Identifies the date the detail entry was added.

&TIME
Identifies the time the detail entry was added.

&SENDERID
Identifies the reporter who submitted the detail entry.

&SNODE or &SENDERNODE
Identifies the node of the reporter who submitted the detail entry.

&DA or &DATA
Identifies actual message text.

&RV or &REFVALUE
Identifies the reference value of the detail entry.

&PR or &PRIORITY
Identifies the priority of the detail entry.

&CO or &COLOR
Identifies the color of the detail entry.

&HI or &HIGHLITE
Identifies the highlight level of the detail entry.

Usage

You can tailor all of the functions except F3.

Describing Function Keys on the Detail Panel, Part 1 (DPFKDESC1)

Purpose

The DPFKDESC1 parameter defines the first part of the function key description that is displayed at the bottom of the detail panel. This text is concatenated with the text defined with the DPFKDESC2 statement.

Syntax

DPFKDESC1

```
►►──DPFKDESC1=text──────────────────────────────────────────────────►◄
```

Parameters

text

Up to 40 characters of data.

Example

```
DPFKDESC1='PF1=HELP PF2=END PF3=RETURN'
```

Describing Function-Key Text on the Detail Panel, Part 2 (DPFKDESC2)

Purpose

The DPFKDESC2 parameter defines the second part of the PF key description that is displayed at the bottom of the detail display. This text is concatenated with the text defined with the DPFKDESC1 statement.

Syntax

DPFKDESC2

```
►►──DPFKDESC2=text──────────────────────────────────────────────────────►◄
```

Parameters

text
   Up to 40 characters of data.

Example

```
DPFKDESC2='PF6=ROLL PF7=UP PF8=DOWN'
```

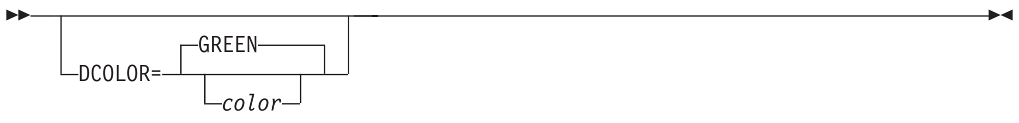
Defining Default Colors (DCOLOR)

Purpose

The DCOLOR parameter defines the appropriate color for a status descriptor that is outside of the defined priority and color ranges. This entry is optional. If you do not specify a value, the default is green.

Syntax

DCOLOR



Parameters

color
Blue, red, pink, green, turquoise, yellow, and white are valid colors.

Usage

Use the value WHITE, which is provided in the EZLINIT member in DSIPARM, and which does not conflict with existing status and color definitions.

Example

```
DCOLOR = WHITE
```

Defining Default Colors for Status Components (EMPTYCOLOR)

Purpose

The EMPTY COLOR parameter defines the color that is displayed for a status component that has no status descriptor associated with it. This entry is optional. If you do not specify a value, the default is green.

Syntax

EMPTYCOLOR

```
►►──┬──────────────────────────────┬──────────────────────────────────►◄
    │                ┌─GREEN────┐  │
    └─EMPTYCOLOR=────┴─┬───────┬┴──┘
                       └─color─┘
```

Parameters

color
    Blue, red, pink, green, turquoise, yellow, and white are valid colors.

Usage

Use the color BLUE, which is provided in the SEZLSENU member of EZLINIT, it does not conflict with existing status or color definitions. This parameter can be overridden in the EZLTREE member.

Example

```
EMPTYCOLOR = BLUE
```

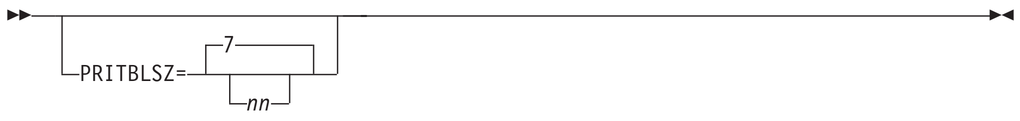
Defining Priority and Color Ranges (PRITBLSZ)

Purpose

The PRITBLSZ parameter defines the number of priority and color ranges defined by the PRIORITY entries. This entry is optional. If you do not specify a value, the default is 7.

Syntax

PRITBLSZ



Parameters

nn Valid number greater than 7

Usage

Use the number 12, which is provided with the EZLINIT member in DSIPARM.

Example

```
PRITBLSZ = 12
```

Defining Color and Priority Ranges (PRIORITY)

Purpose

The PRIORITY parameter defines the relationship between colors and priority ranges. This entry is optional. If you do not specify values, the defaults are:

Color	**Priority**
Red	001 to 099
Pink	100 to 199
Yellow	200 to 299
Blue	300 to 399
Turquoise	400 to 499
White	500 to 599
Green	600 to 699

Syntax

PRIORITY

```
►►──┬──────────────────────────┬───────────────────────────────────────────►◄
    └─PRIORITY=nnn,mmm,color─┘
```

Parameters

nnn
: Valid number between 001 and 999.

mmm
: Valid number between 001 and 999 and equal to or greater than the value specified in *nnn*.

color
: Red, green, yellow, turquoise, pink, blue, and white are valid colors.

Usage

Use the values provided with the EZLINIT member in DSIPARM.

Example

```
PRIORITY=100,199,RED
PRIORITY=200,299,PINK
PRIORITY=300,399,YELLOW
PRIORITY=400,499,TURQUOISE
PRIORITY=500,599,GREEN
PRIORITY=600,699,BLUE
DCOLOR=WHITE
EMPTYCOLOR=BLUE
```

Defining the Panel Statements (EZLPNLS)

The EZLPNLS member in the CNMPNL1 data set defines the DDF status panels. The structure of each panel definition is as follows:

1. Beginning panel definition (PANEL)
2. Status component definition (STATUSFIELD and STATUSTEXT)
3. Text fields and data definition (TEXTTEXT and TEXTFIELD)
4. Function key definition unique to this panel (PFK*nn*)
5. End panel definition (ENDPANEL)

Defining New Panels (PANEL)

Purpose

The panel entry identifies the start of a new panel and its general attributes.

Syntax

PANEL

```
►►──PANEL──(──name──,length──,width──┬────────────┬──┬───────────┬──────────────►
                                     └─,top_panel─┘  └─,up_panel─┘

►─┬─────────────┬──┬─────────────┬──┬───────────────┬─────────────────────────►◄
  └─,down_panel─┘  └─,left_panel─┘  └─,right_panel)─┘
```

Parameters

name
: Identifies a user-defined panel name up to 8 characters in length.

length
: Defines the number of lines or rows on the screen. You must specify a numeric value.

width
: Defines the number of columns on the screen. You must specify a numeric value.

top_panel
: Defines the panel that displays when the TOP command is issued or the appropriate function key is pressed.

up_panel
: Defines the panel that displays when the UP command is issued or the appropriate function key is pressed.

down_panel
: Defines the panel that displays when the DOWN command is issued or the appropriate function key is pressed.

left_panel
: Defines the panel that displays when left panel function key is pressed or LEFT command is issued.

right_panel
: Defines the panel that displays when the right panel function key is pressed or the RIGHT command is issued.

Usage

The default initial panel name supplied with AON is called EZLPNLST. If you change this name, also change the definition in the EZLINIT member for the INITSCRN entry to reflect this. If you have more data than can be displayed on a single screen, you can define continuation panels with the *left_panel_name*, *right_panel_name*, and *down_panel_name* parameters.

The parameters are positional.

Example

This example defines EZLPNSNA as the panel name:

```
PANEL(EZLPNSNA,24,80,EZLPNL1,EZLPNL1, , ,)
```

The length of the panel is 24 and the width is 80. The panel named EZLPNL1 is displayed when the TOP command is used and the panel named EZLPNL1 is displayed when the UP command is used. No entries are defined for the DOWN, LEFT, or RIGHT commands.

Locating the Status Component (STATUSFIELD)

Purpose

The STATUSFIELD entry defines the location of the status component on a panel and the panels that display when the UP and DOWN commands are used. A STATUSFIELD entry is always accompanied by a STATUSTEXT entry.

Syntax

STATUSFIELD

```
►►──STATUSFIELD──(──root_cmpt.─┬─────────────┬─,start_line─────────────────►
                               └─status_cmpt─┘

►─┬─────────────────┬─,end_position─┬────────────┬─┬───────────┬───────────►
  └─,start_position─┘               └─,highlight─┘ └─,up_panel─┘

►─┬─────────────┬─┬────────────────────────────┬─)─────────────────────────►◄
  └─,down_panel─┘ └─,status_descriptor_number──┘
```

Parameters

root_cmpt
: Defines the root name as defined in the root node of the tree structure. You must specify the root (as opposed to the status component alone), because different systems can have status components with the same name defined in their respective tree structures. For example, the status component LINE is often used. Because the root and status component must always be unique, each status component in a tree structure can be uniquely identified by adding the root component entry as a prefix.

status_cmpt
: Defines the status component name as defined in the EZLTREE member. The maximum length is 8 characters.

start_line
: Defines the line number where the status component is displayed. The entry is numeric and within the range specified in the length parameter in the panel definition statement.

start_position
: Defines the actual column number on the start line. The start line is specified above where the component is to be placed. There must be a minimum of 2 spaces between the ending position of one field and the beginning position of the next field to allow for attribute type. For example, if the end position of the status field is in column 10, the start position of the next STATUSFIELD must be in column 13.

  Note: You cannot start the component in position one because it always needs one leading byte.

end_position
: Defines the column number in which the definition of the component ends. This is governed by the length of the text that is defined in the STATUSTEXT definition. For example, if you define LINE, the length of the STATUSTEXT is four and the end position is the start position plus three. See "Defining the

Text Area (STATUSTEXT)" on page 63 for more information. You must have at least 2 bytes between the end position of one field and the beginning position of the next field for attribute bytes.

highlight
: Defines the type of highlighting. You can use normal, blink, reverse, or underscore. Define highlighting as normal, although it can be overridden with individual DDFADD requests.

up_panel
: Defines the panel that is to be displayed if the Up function key is pressed.

down_panel
: Defines the panel that is to be displayed if the Down function key is pressed.

status_descriptor_number
: Defines the number of the status descriptor. Use a numeric value in the range of 1–999. Status descriptors are chained with the status component in ascending order of priority. A panel can be designed with the same status-component name defined in every STATUSFIELD entry. The status descriptor number specifies the status descriptor displayed in each field. For example, if you specified two STATUSFIELD entries for the same status component with status descriptor numbers 1 and 2 , the status descriptor with the higher priority is displayed in the status field with status descriptor number 1. The next higher priority status descriptor is displayed in the status field with status descriptor number 2.

  You can add a letter that denotes the type of information to be displayed as a prefix for the status descriptor. If you do not add a prefix, you can provide text with individual DDFADD requests using the INFO keyword. See "Adding Status Descriptors (DDFADD)" on page 99 for more information. Valid description prefixes are:

C	Displays the name of the component
D	Displays the date the record was added
M	Displays the message text
P	Displays the priority of the record
R	Displays the name of the root
S	Displays the ID of the requester
T	Displays the time the record was added
U	Displays the number of duplicate records
V	Displays the reference value of the requester
X	Displays the domain of the requester

Usage

When designing a panel for any status component, make the end position greater than or equal to the start position; otherwise, unpredictable results can occur during DDF initialization.

The component start position is column 02.

Parameters are positional.

Example

In this example, the LINES on CNM01 status component start on line 04 in column 10, end in column 14, have normal highlighting:

```
STATUSFIELD(CNM01.LINES,04,10,14,NORMAL, ,)
```

No entries are defined for the UP or DOWN commands.

Example

In this example, the status component starts on line 02 in column 04, ends in column 11, and has normal highlighting:

```
SF(CNM01.SYSTEM,02,04,11,N,,EZLPNSNA)
```

No entries are defined for the UP panel and the EZLPNSNA entry is defined for the DOWN command.

Example

In this example, three STATUSFIELD entries are defined for the same CNM01.PU status component:

```
SF(CNM01.PU,02,04,11,NORMAL, , ,01)
SF(CNM01.PU,03,04,11,NORMAL, , ,02)
SF(CNM01.PU,04,04,11,NORMAL, , ,03)
```

The highest priority status descriptor is displayed in the first entry, the next in the second, and so on.

Example

In this example, three STATUSFIELD entries are defined for the same CNM01.RESOURCE status component:

```
SF(CNM01.RESOURCE,04,02,05,NORMAL, , ,P01)
SF(CNM01.RESOURCE,04,08,15,NORMAL, , ,C01)
SF(CNM01.RESOURCE,04,18,79,NORMAL, , ,M01)
```

The first status descriptor is displayed, with its priority in column 02, its component name in column 08, and its message text starting in column 18.

Defining the Text Area (STATUSTEXT)

Purpose

The STATUSTEXT entry defines the text data displayed in the STATUSFIELD entry. The value of this entry is normally the name of the status.

Syntax

STATUSTEXT

```
►►──STATUSTEXT(text)──────────────────────────────────────────────────►◄
```

Parameters

text
: Defines the data displayed for the status component defined in STATUSFIELD entry. The maximum length is 76 alphanumeric characters. Use the name specified for the status component, such as CNM01.LINE. The length of text determines the end position that is coded in the STATUSFIELD entry.

Usage

Each STATUSFIELD entry must have a STATUSTEXT entry associated with it.

The STATUSTEXT text can be overridden by individual DDFADD requests using the INFO keyword. See "Adding Status Descriptors (DDFADD)" on page 99 for more information.

Example

In this example, the resource type LINE, on CNM01 displays as LINE on the status display panel:

```
STATUSFIELD(CNM01.LINES,04,10,13,NORMAL, ,)
STATUSTEXT(LINE)
```

Note: The end position in the STATUSFIELD reflects the length of resource line names.

Example

In this example, the text is not specified for the STATUSTEXT entry for LINE:

```
STATUSFIELD(CNM01.LINE,10,15,25,NORMAL, , )
STATUSTEXT( )
```

You can use 12 characters for any text by the associated STATUSFIELD entry. Provide this text with individual DDFADD requests by using the INFO keyword.

Defining Text Location (TEXTFIELD)

Purpose

This entry defines the location and attributes of fields that remain constant such as panel headings, field names, and function key designations.

Syntax

TEXTFIELD

```
►►──TEXTFIELD──(──start_line──,start_position──,end_position──┬────────┬──────────►
                                                              └─,color─┘

►──┬──────────────┬────────────────────────────────────────────────────────────►◄
   └─,highlight)──┘
```

Parameters

start_line
: Defines the line number on which the text field is displayed. The entry is numeric and within the range specified in the length parameter in the panel definition statement.

start_position
: Defines the column number on which the text field is placed.

end_position
: Defines the column number in which the data specified in entry TEXTTEXT ends. See "Defining Displayed Text (TEXTTEXT)" on page 65 for more details.

color
: Defines the color of the text. You can use blue, red, green, yellow, pink, turquoise, or white for the color to be displayed in the TEXTTEXT entry text.

highlight
: Defines the type of highlighting. You can use normal, blink, reverse, or underscore to determine the TEXTTEXT entry text display.

Usage

When designing a panel, for any TEXTFIELD, make the end position of the TEXTFIELD greater than, or equal to, the start position. Otherwise, unpredictable results can occur during DDF initialization.

The parameters are positional.

Example

In this example, the TEXTFIELD is defined as being on line 1, starting in column 25, ending in column 57, white in color, and with normal highlighting:

```
TEXTFIELD(01,25,57,WHITE,NORMAL)
```

Defining Displayed Text (TEXTTEXT)

Purpose

The TEXTTEXT entry defines the data displayed in the corresponding TEXTFIELD entry.

Syntax

TEXTTEXT

```
►►──TEXTTEXT(text)────────────────────────────────────────────────────►◄
```

Parameters

text

Defines the data displayed for the TEXTFIELD entry. The length of the data determines the end position that is coded in the TEXTFIELD entry. Maximum length is 72 alphanumeric characters.

Usage

Each TEXTFIELD entry must have a TEXTTEXT entry associated with it.

Example

In this example, the text DATA CENTER NETWORKS displays on the status display panel in white:

```
TEXTFIELD(01,25,57,WHITE,NORMAL)
TEXTTEXT(DATA CENTER NETWORKS)
```

Example

In this example, all the function key settings will be displayed on line 24 of the Status Display panel:

```
TF(24,01,48,TURQUOISE,NORMAL)
TEXTTEXT(PF1=HELP 2=DETAIL 3=END  6=ROLL 7=UP 8=DN)
TF(24,51,79,T,N)
TT(10=LF 11=RT 12=TOP)
```

Notice that two entries are coded for the same line number.

Defining Function Keys on the Status Panel (PFKnn)

Purpose

The PFK*nn* entry defines all of the function keys that are unique to this panel.

Syntax

PFK

```
►►──PFKnn(command var)──────────────────────────────────────────────────►◄
```

Parameters

nn Values can range from 1 to 24.

command
The command is issued when the defined function key is pressed.

var
Variable can have the following values for this command:

&COMP
Identifies the component.

&COMPAPPL
Identifies the generic component within parentheses (for example, PU01(PU)). The generic component is shown only if the component was added using one.

&ROOT
Identifies the root or system.

&SYSDATE
Identifies the system date.

&SYSTIME
Identifies the system time.

&IN or &INFO
Identifies the detail entry word text that is displayed on the status panel.

&DATE
Identifies the date that the detail entry was added.

&TIME
Identifies the time that the detail entry was added.

&SENDERID
Identifies the reporter who submitted the detail entry.

&SNODE or &SENDERNODE
Identifies the node of the reporter who submitted the detail entry.

&DA or &DATA
Identifies the actual message text.

&RV or &REFVALUE
Identifies the reference value of the detail entry.

&PR or &PRIORITY
Identifies the priority of the detail entry.

&CO or &COLOR
Identifies to the color of the detail entry.

&HI or &HIGHLITE
Identifies the highlight level of the detail entry.

Usage

You can redefine all of the function keys except F3.

The definitions are active only when the status panel is displayed. The default settings defined with the initialization PFK*nn* statement are overridden.

F3 is always RETURN.

Example

In this example, the `DIS PU01` command is issued when F4 is pressed with the cursor placed on the PU01 entry:

```
PFK4(DIS &INFO)
```

Defining the End of a Panel (ENDPANEL)

Purpose

The ENDPANEL entry identifies the end of a panel.

Syntax

ENDPANEL

```
►►──ENDPANEL──────────────────────────────────────────────────────────────►◄
```

Including Additional Members %INCLUDE

Purpose

The %INCLUDE entry includes additional members that contain panel definitions statements.

Syntax

%INCLUDE

```
►►──%INCLUDE──member─────────────────────────────────────────────────────►◄
```

Parameters

member
: Use this keyword to specify the name of a member that defines a panel using the panel statements described in this section. The member must reside on a data set referenced by DSIPARM.

Chapter 4. Implementing Dynamic Display Facility (DDF)

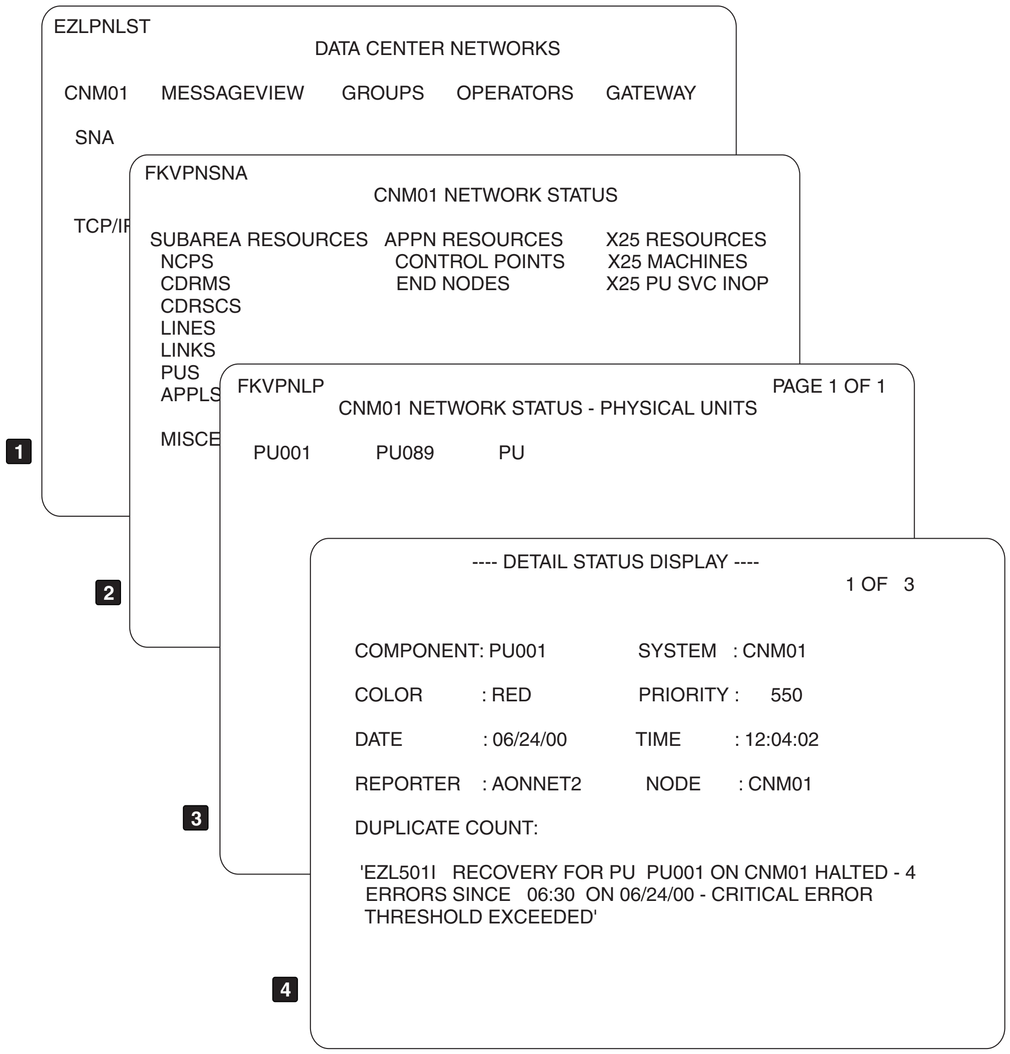
This chapter describes the implementation of Dynamic Display Facility (DDF) and shows samples. You can use these samples to customize the DDF displays for your environment. These samples:

- Display network status on multiple panels
- Display network status on a single-panel
- Define a MessageView display
- Implement DDF in a focal-point environment
- Use operator MARK panels
- Store a DDF update under multiple components
- Group resources in DDF

Each sample in this chapter shows how DDF panels are displayed when the sample is implemented, how DDF processes resource status, how you define the sample, and how to use it.

Displaying Network Status on Multiple Panels

When AON is shipped, a multiple panel display is sent as the default. This is the most useful display implementation. Figure 12 on page 72 shows a multiple panel display with numbered panels. The panels are described in the following section.



```
EZLPNLST
                    DATA CENTER NETWORKS

CNM01    MESSAGEVIEW    GROUPS    OPERATORS    GATEWAY

 SNA

 TCP/I
```

```
FKVPNSNA
                 CNM01 NETWORK STATUS

SUBAREA RESOURCES  APPN RESOURCES     X25 RESOURCES
 NCPS               CONTROL POINTS     X25 MACHINES
 CDRMS              END NODES         X25 PU SVC INOP
 CDRSCS
 LINES
 LINKS
 PUS
 APPLS

 MISCE
```

```
FKVPNLP                                        PAGE 1 OF 1
        CNM01 NETWORK STATUS - PHYSICAL UNITS

 PU001        PU089        PU
```

```
              ---- DETAIL STATUS DISPLAY ----
                                                1 OF   3


 COMPONENT: PU001              SYSTEM   : CNM01

 COLOR         : RED           PRIORITY :      550

 DATE          : 06/24/00      TIME       : 12:04:02

 REPORTER   : AONNET2          NODE       : CNM01

 DUPLICATE COUNT:

  'EZL501I   RECOVERY FOR PU  PU001 ON CNM01 HALTED - 4
   ERRORS SINCE   06:30  ON 06/24/00 - CRITICAL ERROR
   THRESHOLD EXCEEDED'
```

Figure 12. Displaying Network Status on Multiple Panels

1 The Data Center Network panel is the first DDF panel. In Figure 5 on page 17, **SNA** and **TCP/IP** represent the SNA, and TCP/IP resources in the domain CNM01. To see the types of SNA resources defined to CNM01, move the cursor to **SNA** and press the down key, **F8**.

2 All the monitored SNA resource types within network CNM01 are displayed on the CNM01 Network Status panel. To see the names of the physical units that require operator attention defined in CNM01, move the cursor to **PUS** and press the down key, **F8**.

3 The next panel shows the names of the physical units that are experiencing problems. DDF shows each monitored resource in the color of its status. For example, PU001 is shown in red if the status is INACTIVE and requires operator intervention for recovery. To see the detail record, move the cursor to **PU001** and press the detail key, **F2**.

4 The status details record for PU001 is shown on the Detail Status Display. The physical unit, PU001, requires operator intervention because a critical threshold has been reached and automation has stopped.

Multiple programs can update DDF at the same time with resource status without concern for the sequence or priorities posted by other programs. As AON automation resolves the problems, the resources are removed from DDF.

Use the DDF MARK function to show that a problem is being addressed. To mark a problem, display the Detail Status Display for the problem and press **F2**.

The operator ID is appended to the message at the bottom of the detail panel. When other users view DDF, their panel shows that someone is working on that particular problem. The MARK function eliminates the possibility of duplicated effort. The MARK and UNMARK commands are explained in "Using Operator MARK Panels" on page 85.

Understanding the Multiple Panel Display Function

The AON member EZLTREE contains entries for specific VTAM resource types, including NCP, LINES, and CDRMs when AON/SNA is installed. When a network problem occurs, AON adds a problem descriptor to DDF with the appropriate VTAM resource type. These problems propagate up the hierarchy that is defined in the EZLTREE member. AON arranges the problems in EZLTREE in order of severity. The highest level component reflects the most severe problem.

DDF displays network problems in a series of panels. AON provides a high-level system panel, an intermediate resource type panel, and a unique panel for each resource type. The high-level panel (EZLPNLST) shows the status of the problem with the highest priority in the system. The intermediate panel (FKVPNSNA) shows the color of the status of problem with the highest priority for unique resource types. Finally, the unique resource type panels show all resource names for a given resource type in order of the priority of the problem.

Defining Multiple Panel Displays

The following SNA-specific example requires these CNMPNL1 and DSIPARM members:

EZLTREE
: Tree

EZLPNLST
: Main DDF menu panel

FKVPNSNA
: Resource Type menu panel

FKVPNLA
: APPLs panel

FKVPNLN
: NCP panel

FKVPNLC
: CDRM panel

FKVPNLD
: CDRSC panel

FKVPNLL
: LINES panel

FKVPNLM
: LINKS panel

FKVPNLP
: PU panel

FKVPNLR
: Resource (MISC--unrecognized resource type)

FKVPNL21
: All Resources menu panel

EZLPNLG
: Gateway panel

EZLPNL01
: MESSAGEVIEW panel (First)

EZLPNL02
: MESSAGEVIEW panel (First Down)

EZLPNL0A
: MESSAGEVIEW panel (Right)

EZLPNL0B
: MESSAGEVIEW panel (Right Down)

FKVCFGDS
: Control file DDF status statements

FKVPNAC
: AON Control Point panel

FKVPNAE
: APPN End Nodes panel

FKVPNA1
: All APPN Resources panel

FKVPNLX1
: X25 All Resources panel

FKVPNLX2
: X25 Machines panel

FKVPNLX3
: X25 Inop SVCs panel

The following sections describe how to customize the samples.

Updating the EZLTREE Member

Update the EZLTREE tree root name CNM01 to the name that is coded in your ENVIRON SETUP SYSNAME parameter. Refer to the following:

```
/*   NETWORK : CNM01                          */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
  6 EN
5 X25
  6 X25MCH
  6 X25PU
```

Updating the EZLCFG01 Member

To update the EZLCFG01 member:

1. In the ENVIRON SETUP definition in EZLCFG01, customize the SYSNAME value to reflect your domain ID. The SYSNAME can be any 5-character name used to identify this NETWORK domain. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information on tailoring the ENVIRON SETUP statement.
2. Set the DDF parameter in the ENVIRON DDF statement to DDF=STATUS if you want DDF to assign problem priority based on resource status. The DDF panel display shipped with AON is assigned by status.

Updating the EZLPNLS Member

To update the EZLPNLS member:

1. For AON/SNA, ensure %INCLUDE statements for the panels listed previously are present and not commented out.
2. Edit each of the panel samples and change all occurrences of CNM01 to the SYSNAME defined in the ENVIRON SETUP SYSNAME definition in EZLCFG01.

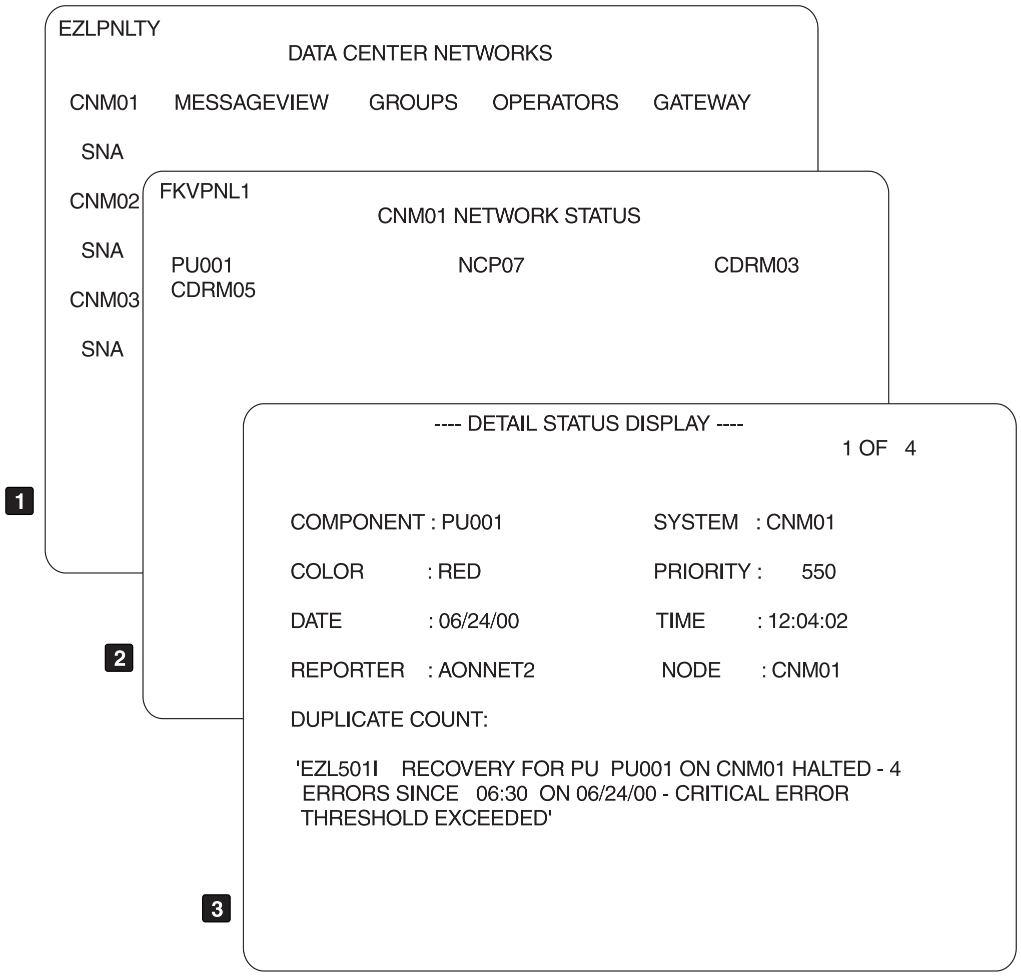
Updating the EZLINIT Member

Ensure the INITSCRN parameter is set to EZLPNLST.

Displaying Network Status on a Single Panel

In addition to viewing network status on multiple panels, you can view network status on a single panel.

Figure 13 on page 76 shows a single-panel display. The panels are described in the definition list that follows the figure.



```
EZLPNLTY
                    DATA CENTER NETWORKS

 CNM01    MESSAGEVIEW    GROUPS    OPERATORS    GATEWAY

  SNA

 CNM02

  SNA

 CNM03

  SNA
```

```
FKVPNL1
                    CNM01 NETWORK STATUS

 PU001                   NCP07                   CDRM03
 CDRM05
```

```
                 ---- DETAIL STATUS DISPLAY ----
                                                  1 OF   4


 COMPONENT : PU001                SYSTEM   : CNM01

 COLOR         : RED              PRIORITY :      550

 DATE          : 06/24/00         TIME       : 12:04:02

 REPORTER   : AONNET2             NODE      : CNM01

 DUPLICATE COUNT:

 'EZL501I    RECOVERY FOR PU  PU001 ON CNM01 HALTED - 4
  ERRORS SINCE   06:30  ON 06/24/00 - CRITICAL ERROR
  THRESHOLD EXCEEDED'
```

Figure 13. Displaying Network Status on a Single Panel

1 The Data Center Network panel is the main panel from which you can display a number of unique networks. This is the first panel displayed when you invoke DDF. The NetView domains that send notifications to this DDF are CNM01, CNM02, and CNM03. For this example, suppose that CNM01 is highlighted in red, indicating an error status. The operator moves the cursor to CNM01 and presses F8 to move down in the hierarchy and display the CNM01 Network Status panel.

2 All resources requiring operator attention are color-coded by status. All resources in the network are displayed on this panel. You can customize the keys on this panel in EZLINIT "Defining Initialization Statements (EZLINIT)" on page 39.

The resource name that is displayed in the upper left corner has the highest priority of current problems. In this example, PU01 has the problem with the highest priority. PU01 is in red because the status is INACTIVE and requires operator intervention for recovery. The operator uses the Tab key to move the cursor to PU01 and presses F2 to display the Detail Status Display.

3 The Detail Status Display describes a problem for status descriptor PU01. PU01 requires operator intervention because a critical threshold was reached and automation stopped. To see only SNA resource failures (EZLPNL1), move the cursor to `SNA` and press F8.

Note that the Detail Status Display has function keys for the DDF commands, MARK (F2) and UNMARK (F10). With MARK, an operator can assign a status error to his ID from the Detail Status Display. The MARK and UNMARK commands are explained in "Using Operator MARK Panels" on page 85.

Understanding How Single-panel Displays Work

The AON member EZLTREE contains entries for specific VTAM resource types, including NCP, LINES, and CDRMS. In EZLTREE, all these VTAM resource types are defined one level lower than the AON component NETWORK. When a problem occurs in the network, AON adds a problem descriptor to DDF, using the appropriate VTAM resource type. When a problem is added using the resource type, it propagates up the tree so that the component NETWORK contains all network-related problems.

AON provides a single panel that shows, in priority order, all the resource names in the network that have problems. The panel uses the component name NETWORK to display all the network-related problems.

The priority of the problem is determined by what is coded on the ENVIRON DDF statement. If DDF=STATUS is coded, the VTAM status determines the priority of the problem. Resources that are inactive have the highest priority and are red. Resources with pending status have a lower priority and are pink or turquoise. Active resources are not displayed.

When DDF=TYPE is coded, the resource type that has the problem determines the priority. For example, if an NCP is inactive or pending, the problem has high priority and is red. If a PU has an error condition (inactive or pending), the problem has a lower priority and is yellow.

Defining Single Panel Displays

The values shipped in the samples are the default DDF values. The required members are:

EZLTREE	Tree
EZLCFGDS	Control File DDF status definitions
EZLPNLTY	Network View Panel
EZLPNL1	Resource View Panel
EZLPNLG1	Gateway View Panel
EZLPNL03	MessageView Panel First
EZLPNL04	MessageView Panel Right
EZLPNL0C	MessageView Panel Down
EZLPNL0D	MessageView Panel Right
FKVPNL1	SNA Network View panel

Updating the EZLTREE Member

Update the EZLTREE tree root name CNM01 to the SYSNAME defined in the ENVIRON SETUP statement of the control file. Refer to the following example:

```
/*   NETWORK : CNM01                             */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
          6 EN
        5 X25
          6 X25MCH
          6 X25PU
```

Updating the EZLCFG01 Member

To update the EZLCFG01 member:

1. In the ENVIRON SETUP definition in EZLCFG01, customize the SYSNAME value to reflect your domain ID. The SYSNAME can be any 5-character name used to identify this NETWORK domain.
2. Set the DDF parameter in the ENVIRON DDF statement to:
   - DDF=STATUS if you want DDF to assign problem priority based on resource status.
   - DDF=TYPE if you want DDF to assign problem priority based on resource type.

Updating the EZLPNLS Member

To update the EZLPNLS member:

1. For AON/SNA, ensure that the %INCLUDE statements for the panels listed previously are present and not commented out.
2. Edit each of the panel samples and change all occurrences of CNM01 to the SYSNAME defined in the ENVIRON SETUP SYSNAME definition in EZLCFG01.

Updating the EZLINIT Member

In the EZLINIT member, change the INITSCRN parameter to EZLPNLTY.

Updating the EZLPNL1 Member

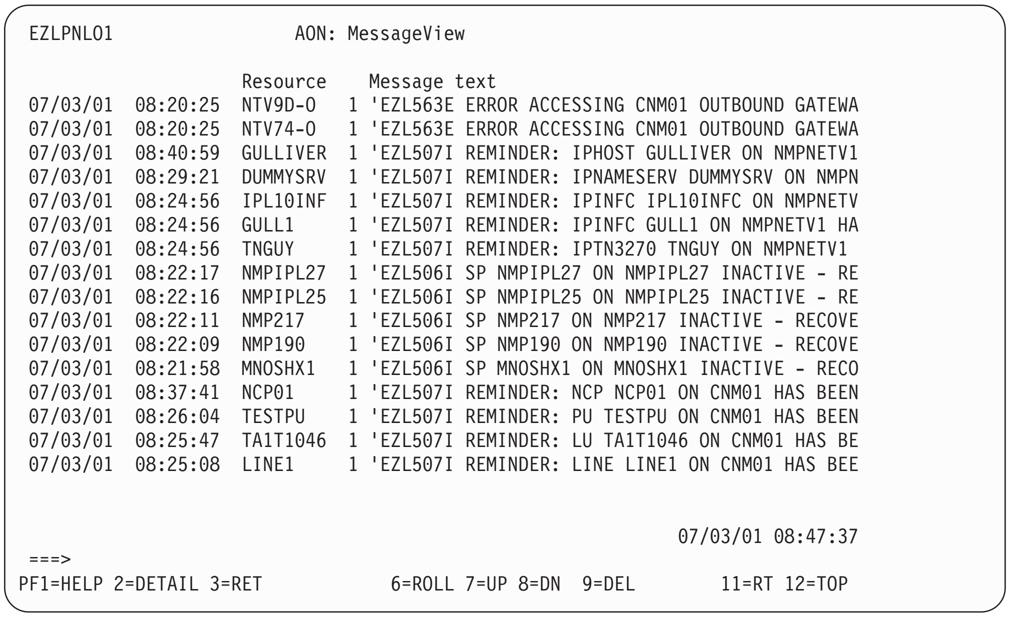
```
/* DEFINE CNM01 NETWORK STATUS PANEL */
P(EZLPNL1,24,80,EZLPNLTY,EZLPNLTY, , , )
TF(01,02,09,T,NORMAL)
TT(EZLPNL1)
TF(02,27,57,WHITE,NORMAL)
TT(CNM01 NETWORK STATUS)
SF(CNM01.NETWORK,04,05,16,N, , ,01)
ST( )
SF(CNM01.NETWORK,04,25,36,N, , ,02)
ST( )
SF(CNM01.NETWORK,04,45,56,N, , ,03)
ST( )
SF(CNM01.NETWORK,04,65,76,N, , ,04)
ST( )
⋮
SF(CNM01.NETWORK,20,25,36,N, , ,30)
ST( )
SF(CNM01.NETWORK,20,45,56,N, , ,31)
ST( )
SF(CNM01.NETWORK,20,65,76,N, , ,32)
ST( )
TF(24,01,52,T,NORMAL)
TT(PF1=HELP 2=DETAIL 3=END 4=DIS 5=CY 6=ROLL 7=UP 8=DN)
TF(24,53,79,T,NORMAL)
TT( 9=DEL 10=LF 11=RT 12=TOP)
EP
```

The tree shows NETWORK to be a level higher than any descriptors added using RESOURCE or under a resource type generic, for example CNM01.PU01(PU). The problem descriptors are propagated up to the status field of CNM01.NETWORK. All descriptors for the NETWORK are displayed on this panel.

If your network has more than 32 resources in an exception condition, duplicate this panel, customize the panel name, and add 32 to the descriptor count on each status field definition. This number causes descriptors 33 through 64 to display on this panel. Update the PANEL definition statement in EZLPNL1 to reflect a RIGHT panel with your new panel name (see “Defining the Panel Statements (EZLPNLS)” on page 57). Customize PANEL statement of your new panel to point LEFT to EZLPNL1.

Defining a MessageView Display

The following sample scenarios demonstrate MessageView. MessageView illustrates the use of status descriptor information types (refer to STATUSFIELD). Every detail descriptor is displayed on the panel along with its date, time, resource name, and message text. This panel provides a quick view of the DDF current descriptors. Figure 14 on page 80 shows a sample MessageView display.



```
 EZLPNLO1                AON: MessageView

                    Resource    Message text
 07/03/01  08:20:25  NTV9D-O   1 'EZL563E ERROR ACCESSING CNM01 OUTBOUND GATEWA
 07/03/01  08:20:25  NTV74-O   1 'EZL563E ERROR ACCESSING CNM01 OUTBOUND GATEWA
 07/03/01  08:40:59  GULLIVER  1 'EZL507I REMINDER: IPHOST GULLIVER ON NMPNETV1
 07/03/01  08:29:21  DUMMYSRV  1 'EZL507I REMINDER: IPNAMESERV DUMMYSRV ON NMPN
 07/03/01  08:24:56  IPL10INF  1 'EZL507I REMINDER: IPINFC IPL10INFC ON NMPNETV
 07/03/01  08:24:56  GULL1     1 'EZL507I REMINDER: IPINFC GULL1 ON NMPNETV1 HA
 07/03/01  08:24:56  TNGUY     1 'EZL507I REMINDER: IPTN3270 TNGUY ON NMPNETV1
 07/03/01  08:22:17  NMPIPL27  1 'EZL506I SP NMPIPL27 ON NMPIPL27 INACTIVE - RE
 07/03/01  08:22:16  NMPIPL25  1 'EZL506I SP NMPIPL25 ON NMPIPL25 INACTIVE - RE
 07/03/01  08:22:11  NMP217    1 'EZL506I SP NMP217 ON NMP217 INACTIVE - RECOVE
 07/03/01  08:22:09  NMP190    1 'EZL506I SP NMP190 ON NMP190 INACTIVE - RECOVE
 07/03/01  08:21:58  MNOSHX1   1 'EZL506I SP MNOSHX1 ON MNOSHX1 INACTIVE - RECO
 07/03/01  08:37:41  NCP01     1 'EZL507I REMINDER: NCP NCP01 ON CNM01 HAS BEEN
 07/03/01  08:26:04  TESTPU    1 'EZL507I REMINDER: PU TESTPU ON CNM01 HAS BEEN
 07/03/01  08:25:47  TA1T1046  1 'EZL507I REMINDER: LU TA1T1046 ON CNM01 HAS BE
 07/03/01  08:25:08  LINE1     1 'EZL507I REMINDER: LINE LINE1 ON CNM01 HAS BEE



                                                                07/03/01 08:47:37
 ===>
PF1=HELP 2=DETAIL 3=RET            6=ROLL 7=UP 8=DN  9=DEL        11=RT 12=TOP
```

Figure 14. Message View Panel

The following example shows how the MessageView panel is defined.

```
/*   MESSAGEVIEW DISPLAY                      */
/*******************************************************************/
P(EZLPNLO1,24,80,EZLPNLST,EZLPNLST,EZLPNLO2, ,EZLPNLOA)
TF(01,02,09,T,NORMAL)
TT(EZLPNLO1)
TF(01,27,60,Y,NORMAL)
TT(AON: MessageView)
TF(03,22,29,T,N)
TT(Resource)
TF(03,34,45,T,N)
TT(Message text)
SF(CNM01.SYSTEM,04,02,09,N, , ,D01)
ST( )
SF(CNM01.SYSTEM,04,12,19,N, , ,T01)
ST( )
SF(CNM01.SYSTEM,04,22,29,N, , ,C01)
ST( )
SF(CNM01.SYSTEM,04,32,79,N, , ,M01)
⋮
TF(24,01,52,T,NORMAL)
TT(PF1=HELP 2=DETAIL 3=RET    6=ROLL 7=UP 8=DN)
TF(24,53,79,T,NORMAL)
TT( 9=DEL        11=RT 12=TOP)
PFK4()
PFK5()
EP
```

In this case, the D01 status descriptor locates the date of the first descriptor in the chain. T01 locates the time, C01 locates the component (usually resource name) and M01 locates the message text of the same descriptor.

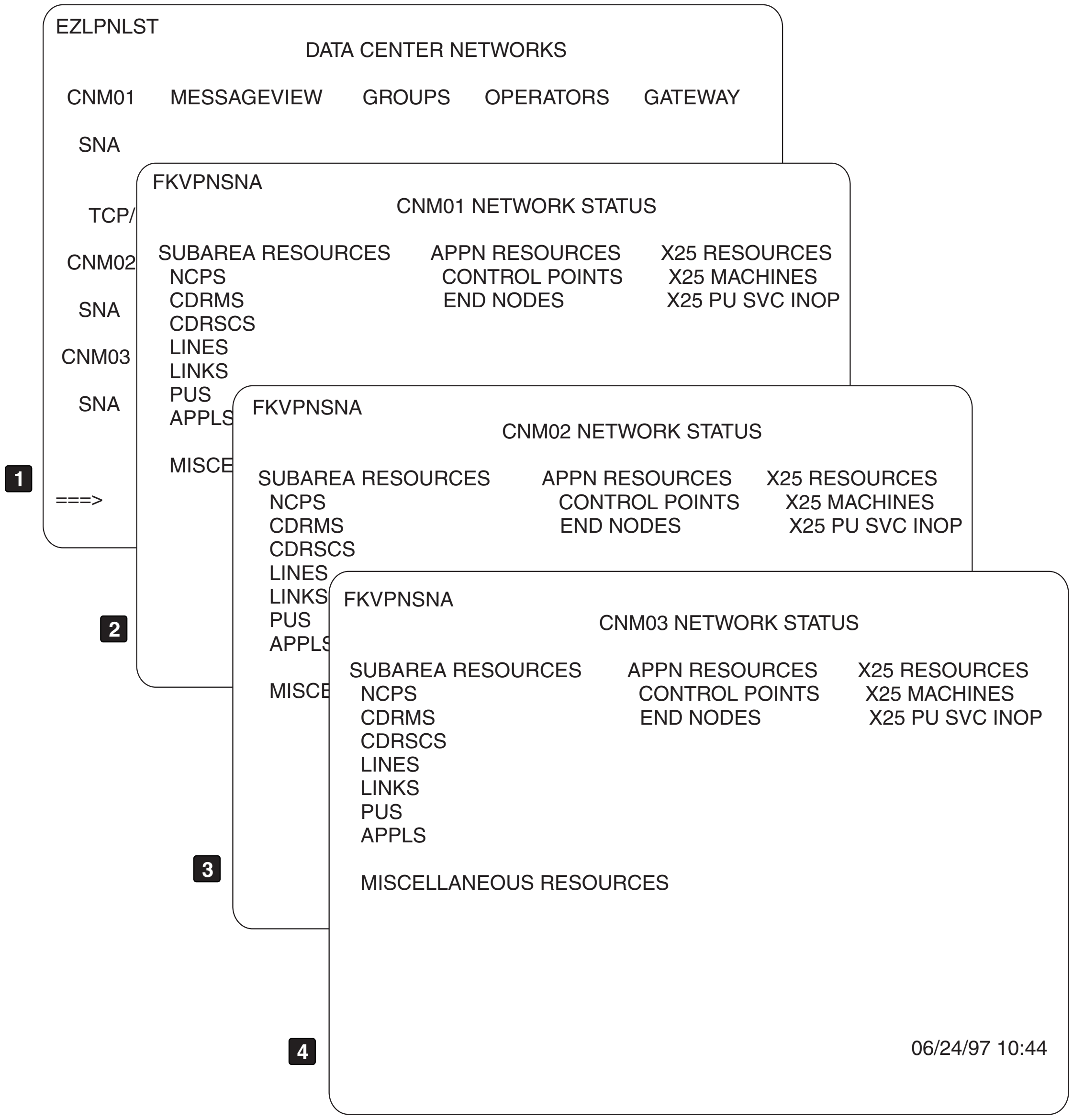
Implementing DDF in a Focal Point Environment

You can customize DDF to display the status of multiple networks at a focal point AON. You can implement notification forwarding from the distributed host to the focal point host.

In a focal point environment, DDF must be defined the same for each domain. The control file for each domain in a focal point environment reflects either ENVIRON DDF,DDF=STATUS or ENVIRON DDF,DDF=TYPE if this code is defined on the focal points.

Viewing a Focal-point Environment

Figure 15 shows focal-point implementation.



```
EZLPNLST
                      DATA CENTER NETWORKS

 CNM01    MESSAGEVIEW    GROUPS    OPERATORS    GATEWAY

   SNA

    TCP/

 CNM02

   SNA

 CNM03

   SNA

===>
```

```
FKVPNSNA
                    CNM01 NETWORK STATUS

SUBAREA RESOURCES     APPN RESOURCES      X25 RESOURCES
  NCPS                  CONTROL POINTS      X25 MACHINES
  CDRMS                 END NODES           X25 PU SVC INOP
  CDRSCS
  LINES
  LINKS
  PUS
  APPLS

  MISCE
```

```
FKVPNSNA
                    CNM02 NETWORK STATUS

SUBAREA RESOURCES     APPN RESOURCES      X25 RESOURCES
  NCPS                  CONTROL POINTS      X25 MACHINES
  CDRMS                 END NODES           X25 PU SVC INOP
  CDRSCS
  LINES
  LINKS
  PUS
  APPLS

  MISCE
```

```
FKVPNSNA
                    CNM03 NETWORK STATUS

SUBAREA RESOURCES     APPN RESOURCES      X25 RESOURCES
  NCPS                  CONTROL POINTS      X25 MACHINES
  CDRMS                 END NODES           X25 PU SVC INOP
  CDRSCS
  LINES
  LINKS
  PUS
  APPLS

  MISCELLANEOUS RESOURCES




                                              06/24/97 10:44
```

Figure 15. Focal-Point Implementation

For an explanation of each panel in Figure 15, match the numeric callouts (for example, **1**) beside the following paragraphs with the callouts beside each panel in Figure 15.

1 The Data Center Networks panel is the main panel from which you can display a number of unique networks. This is the first panel that is displayed when DDF is invoked. The NetView domains sending notifications to this DDF are CNM01, CNM02, and CNM03. This example shows which panels are displayed when you select any of the domains from the Data Center Network panel.

2 All the monitored resource types within domain CNM01 are displayed on the CNM01 Network Status panel. This panel is tailored to display only resources in domain CNM01.

3 All the monitored resource types within domain CNM02 are displayed on the CNM02 Network Status panel. This panel is tailored to display only resources in domain CNM02.

4 All the monitored resource types within domain CNM03 are displayed on the CNM03 Network Status panel. This panel is tailored to display only resources in domain CNM03.

Understanding How a Focal Point Environment Works

AON forwards DDF updates to the focal point. At the focal point, define a tree structure for each domain in the EZLTREE member, so that DDF can determine how to store the update. This update works the same as it did on the originating domain.

To display the update, create unique panels for each domain. Use unique panel names and change the root name coded inside the panels to the root name specified on the originating system.

Defining How a Focal-point Environment Works

The values shipped in the sample in your DSIPARM data set contain the default DDF values.

Updating the EZLTREE Member

1. Copy EZLTREE to a new member, EZLTRE01.
2. Create new tree members for CNM02 and CNM03.
3. Copy EZLTRE01; change the member name and 01 root name.
4. Edit and change EZLTREE, so that EZLTREE contains only the includes for the new members. When completed, the members look like this:

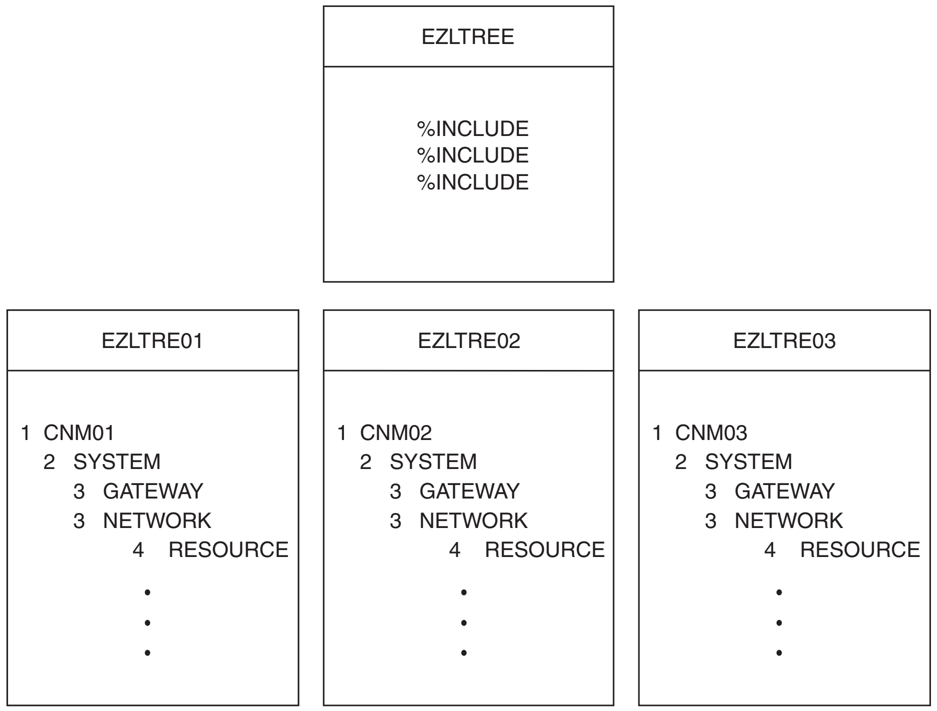


Figure 16. EZLTREE Members

Updating the EZLPNLS Member

Create unique copies of existing panels for each domain. This requires some naming convention for the panels. In this example, the naming convention used is *xxxx*P, where *xxxx* is the domain ID. Depending on how you have chosen to display the network status, you must select one of the following sets of panels:

- AON/SNA multiple-panel display
- Single-panel display

For an AON/SNA multiple-panel display, select one of the following sets of panels:

EZLTREE
: Tree

EZLPNLST
: Main Panel

FKVPSNA
: Resource Type menu panel

FKVPNLA
: APPLs menu panel

FKVPNLN
: NCP menu panel

FKVPNLC
: CDRM menu panel

FKVPNLD
: CDRSC menu panel

FKVPNLL
: LINES menu panel

FKVPNLM
: LINKS menu panel

FKVPNLP
PU menu panel
FKVPNLR
Resource (MISC—unrecognized resource type)
FKVPNL21
All Resources menu panel
EZLPNLG
Gateway menu panel
EZLPNL01
MESSAGEVIEW menu panel First
EZLPNL02
MESSAGEVIEW menu panel Down
EZLPNL0A
MESSAGEVIEW menu panel Right
EZLPNL0B
MESSAGEVIEW menu panel Down
FKVPNAC
AON Control Point panel
FKVPNAE
APPN End Nodes panel
FKVPNA1
All APPN Resources panel
FKVPNLX1
X25 All Resources panel
FKVPNLX2
X25 Machines panel
FKVPNLX3
X25 Inop SVCs panel

For single-panel display, select one of the following sets of panels:
EZLTREE
Tree
EZLPNLTY
Network View Panel
EZLPNL1
Resource View Panel
EZLPNLG1
Gateway View Panel
EZLPNL03
Message View Panel First
EZLPNL04
Message View Panel Right
EZLPNL0C
Message View Panel Down
EZLPNL0D
Message View Panel Right
FKVPNL1
SNA Resource View Panel

To update the EZLPNLS member:

1. Create unique panels for CNM02.

   Copy all panels for your display method, changing the panel name from EZLPNL*xx* to CNM02P*xx*. For example, change EZLPNL1 to CNM02P1. Within each copied panel, change all occurrences of CNM01 to CNM02 and change all occurrences of EZLPNL*xx* to CNM02P (the EZLPNLTY and EZLPNLST—

names must remain unchanged inside the panel). Commands assigned to DDF function keys might not be valid for resources in remote networks. Remove function key definitions that are not appropriate.

2. Create unique panels for CNM03.

   Copy all panels for your display method, changing the panel name from EZLPNL*xx* to CNM03P*xx*. For example, change EZLPNL1 to CNM03P1. Within each copied panel, change all occurrences of CNM01 to CNM03, and change all occurrences of EZLPNL*xx* to CNM03P (except EZLPNLTY and EZLPNLST—these names must remain unchanged inside the panel). Commands assigned to DDF function keys might not be valid for resources in remote networks. Remove any function key definitions that are not appropriate.
3. Add pointers from the Main Data Centers panels to the new panels.

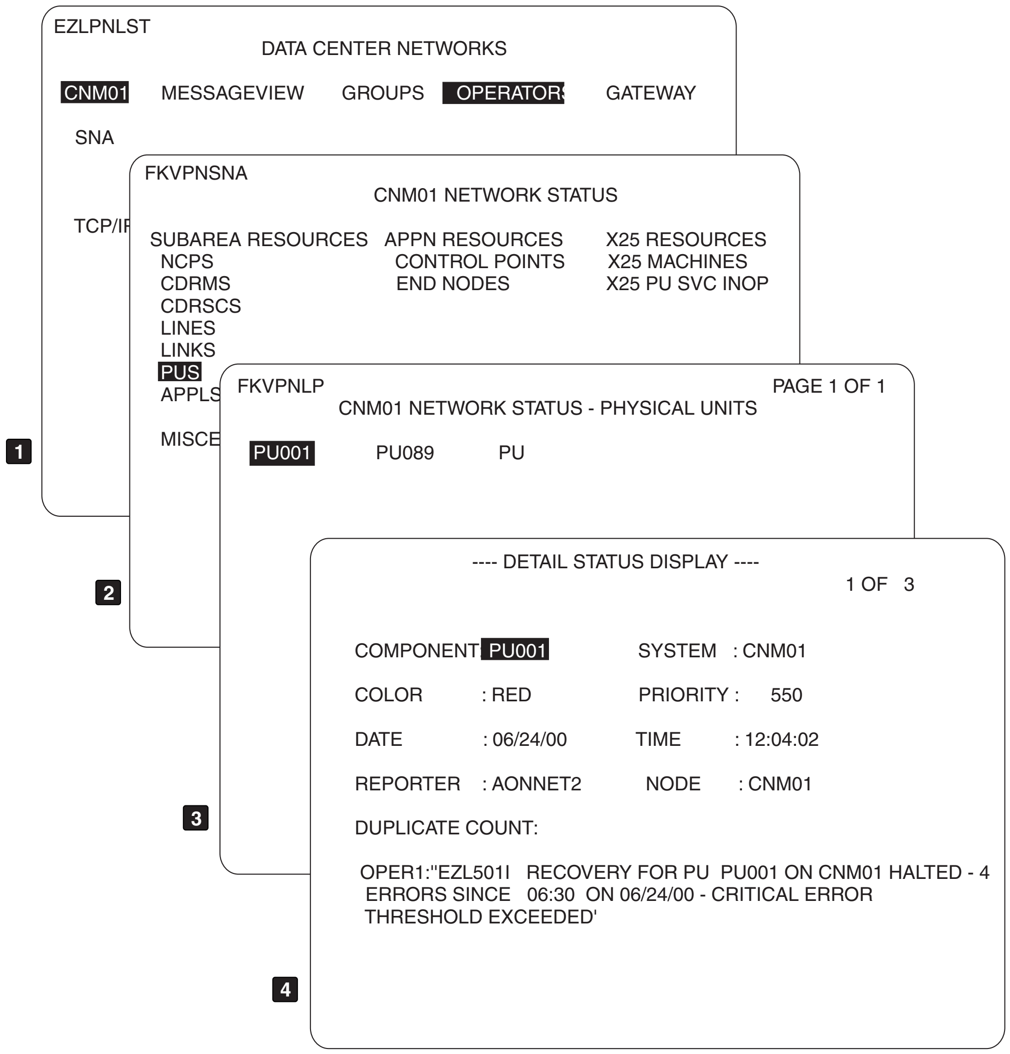
   For multiple panel display, add the following to EZLPNLST:
   ```
   ST(CNM02.NETWORK,04,09,18,N, ,CNM02P2)
   SF(CNM02)
   ST(CNM03.NETWORK,06,09,18,N, ,CNM03P2)
   SF(CNM03)
   ```
   For single-panel display, add the following to EZLPNLTY:
   ```
   ST(CNM02.NETWORK,04,09,18,N, ,CNM02P1)
   SF(CNM02)
   ST(CNM03.NETWORK,06,09,18,N, ,CNM03P1)
   SF(CNM03)
   ```

When DDF is started, the CNM01 network status is primed. As the gateways to CNM02 and CNM03 are established, the DDF status for those networks are forwarded to CNM01. If CNM02 or CNM03 are lost, the descriptors are deleted for that network and a COMMLOST entry is added to indicate that the network status is no longer current.

Using Operator MARK Panels

AON provides two commands for tagging each DDF detail panels with an operator ID. These commands are MARK (**F2**) and UNMARK (**F10**). With these commands, an operator can select network problems from DDF for analysis.

Figure 17 on page 86 illustrates operator MARK panels.



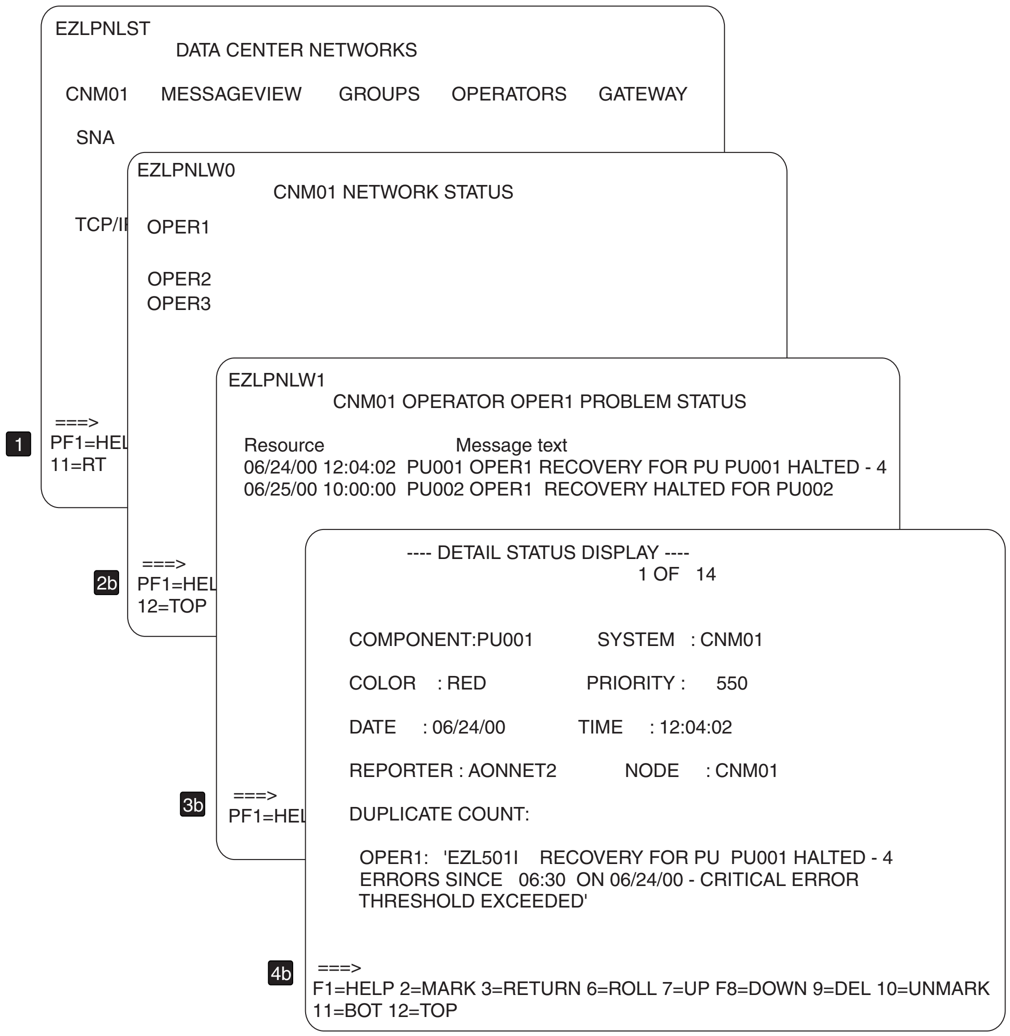
```
EZLPNLST
                    DATA CENTER NETWORKS

CNM01    MESSAGEVIEW    GROUPS    OPERATOR     GATEWAY

 SNA

 TCP/I
```

```
FKVPNSNA
                    CNM01 NETWORK STATUS

SUBAREA RESOURCES  APPN RESOURCES     X25 RESOURCES
  NCPS               CONTROL POINTS     X25 MACHINES
  CDRMS              END NODES          X25 PU SVC INOP
  CDRSCS
  LINES
  LINKS
  PUS
  APPLS

  MISCE
```

```
FKVPNLP                                          PAGE 1 OF 1
        CNM01 NETWORK STATUS - PHYSICAL UNITS

 PU001       PU089       PU
```

```
              ---- DETAIL STATUS DISPLAY ----
                                                  1 OF   3

 COMPONENT: PU001          SYSTEM   : CNM01

 COLOR       : RED           PRIORITY :    550

 DATE        : 06/24/00      TIME      : 12:04:02

 REPORTER    : AONNET2       NODE      : CNM01

 DUPLICATE COUNT:

  OPER1:"EZL501I   RECOVERY FOR PU  PU001 ON CNM01 HALTED - 4
   ERRORS SINCE   06:30  ON 06/24/00 - CRITICAL ERROR
   THRESHOLD EXCEEDED'
```

Figure 17. Operator MARK Panels (Part 1 of 2)


```
EZLPNLST
                DATA CENTER NETWORKS

 CNM01     MESSAGEVIEW      GROUPS     OPERATORS     GATEWAY

  SNA

  TCP/I

 ===>
PF1=HEL
11=RT
```

```
EZLPNLW0
                   CNM01 NETWORK STATUS

 OPER1

 OPER2
 OPER3

 ===>
PF1=HEL
12=TOP
```

```
EZLPNLW1
              CNM01 OPERATOR OPER1 PROBLEM STATUS

  Resource                    Message text
  06/24/00 12:04:02  PU001 OPER1 RECOVERY FOR PU PU001 HALTED - 4
  06/25/00 10:00:00  PU002 OPER1  RECOVERY HALTED FOR PU002

 ===>
PF1=HEL
```

```
              ---- DETAIL STATUS DISPLAY ----
                                               1 OF   14

     COMPONENT:PU001          SYSTEM   : CNM01

     COLOR    : RED                PRIORITY :      550

     DATE     : 06/24/00           TIME     : 12:04:02

     REPORTER : AONNET2            NODE     : CNM01

     DUPLICATE COUNT:

      OPER1:  'EZL501I    RECOVERY FOR PU  PU001 HALTED - 4
      ERRORS SINCE   06:30  ON 06/24/00 - CRITICAL ERROR
      THRESHOLD EXCEEDED'

 ===>
F1=HELP 2=MARK 3=RETURN 6=ROLL 7=UP F8=DOWN 9=DEL 10=UNMARK
11=BOT 12=TOP
```

Figure 17. Operator MARK Panels (Part 2 of 2)

For an explanation of each panel in Figure 17, which starts on page 86, match the numeric callouts beside the panels (for example, **1**) with the following:

4b
: To mark a problem, display the Detail Status Display for the problem and then press **F2**. This action appends the operator's ID to the message at the bottom of the detail panel shown in **4b**.

1 and 2b
: Marking a DDF problem also causes DDF to display the problem in reverse video, both on the Detail Status Display and on the upper level panels, as shown in **1** and **2b**.

If problems are being handled by an operator, they are marked. Other operators can choose unmarked problems for analysis; thereby, preventing duplicate effort.

Understanding Operator MARK Panels

Because the status is displayed in reverse video, operators know at a glance the most severe problems are being addressed. In addition, because the problem is time-ordered, operators know which problems have been outstanding the longest.

From these DDF panels, operators use function keys to recycle the resource to which the cursor points, display those resources, mark descriptors, unmark descriptors, and delete descriptors. NetView commands work from these command lines.

Defining Operator MARK Panels

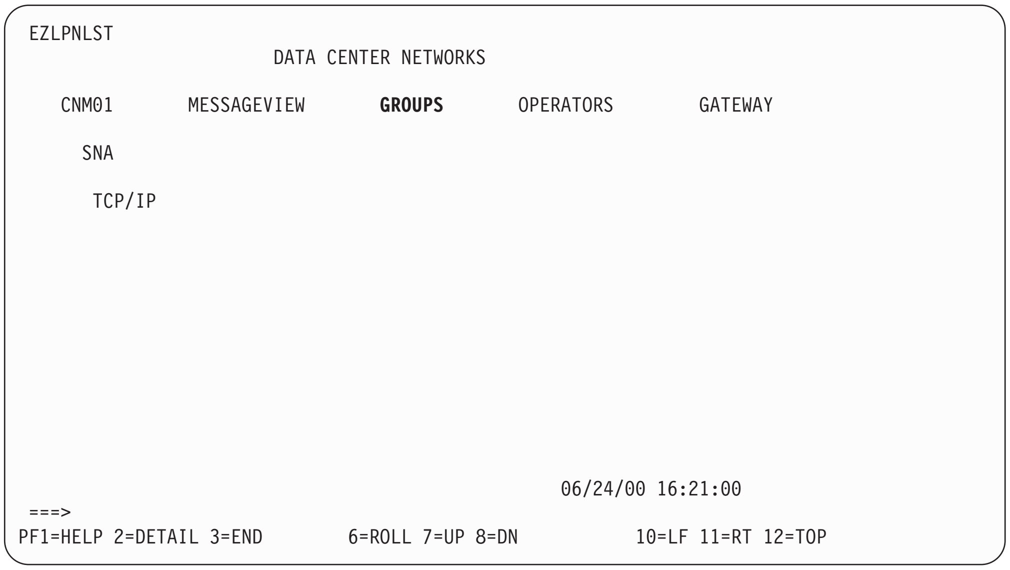
To define operator mark panels update the EZLTREE member used for your DDF with the operator ID appropriate for your DDF installation. To add operator IDs for the DDF MARK function, update EZLTREE:

```
/*   NETWORK : CNM01                                                  */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
      4 OPER2
      4 OPER3
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
          6 EN
        5 X25
          6 X25MCH
          6 X25PU
```

When DDF deletes descriptors at the NETWORK level, it also deletes them from the panel of the operator. Define each operator ID having independent panels in the EZLTREE member.

Grouping Resources in DDF

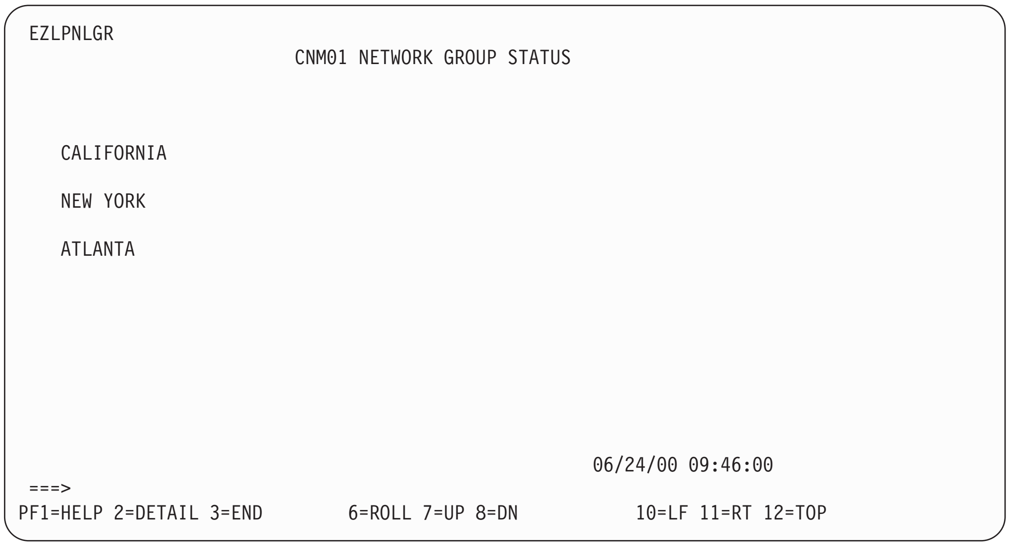
Group resources in DDF by site, application, customer base, company, or by any other criterion. Figure 18 on page 89 shows a sample DDF group.



```
 EZLPNLST
                       DATA CENTER NETWORKS

    CNM01       MESSAGEVIEW       GROUPS       OPERATORS        GATEWAY

      SNA

       TCP/IP











                                                06/24/00 16:21:00
 ===>
PF1=HELP 2=DETAIL 3=END        6=ROLL 7=UP 8=DN          10=LF 11=RT 12=TOP
```

Figure 18. DDF Panel Showing GROUPS

To view the resources in this DDF group, move the cursor to GROUPS and press Enter. Figure 19 shows the resources defined to GROUPS. This sample DDF group is by geographical area.



```
 EZLPNLGR
                         CNM01 NETWORK GROUP STATUS



    CALIFORNIA

    NEW YORK

    ATLANTA









                                                   06/24/00 09:46:00
 ===>
PF1=HELP 2=DETAIL 3=END        6=ROLL 7=UP 8=DN          10=LF 11=RT 12=TOP
```

Figure 19. Sample DDF Group Panel

Grouping Resources for Specific Requirements

The DDFGROUP control file entry groups DDF resources for display. For example, you can group dissimilar DDF resources by geographic location.

Using DDFGROUP statements, AON supports wild cards in DDFGROUP lists and places resources in multiple groups. During initialization, the EZLEAC11 program creates DDFRES control file entries from the DDFGROUP control file entries. To determine which groups are defined for a given resource, check only the DDFRES control file entries. DDF resources are updated under both the applicable DDFGENERIC and DDFGROUP matches.

The syntax of the DDFGROUP control file entry is:

```
DDFGROUP groupname,
        LIST=(res1,res2,...resn)
        LIST=(res1,res2,...resn)
        LIST=(res1,res2,...resn)
        LIST=(res1,res2,...resn)
```

groupname
The name of this group of DDF resources.

Note: You must use *groupname* in EZLTREE and the panel used to display members of this group. Multiple DDFGROUP statements for the same *groupname* are valid.

LIST
The list of resources in the group. Wild cards are supported in resource names. You can create multiple lists. Each complete definition list must be on a single line.

Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for information about DDFGROUP syntax.

The EZLEAC11 program creates the DDFRES control file entries during startup in this format:

```
DDFRES res1,GROUP=(group_name1,group_name2,...group_namen)
```

Note: AON creates all DDFRES control file entries.

The following sample list illustrates the format of DDFGROUP control file entries that create a group of resources according to city:

```
DDFGROUP LA,LIST=(SALA*,GWATLA,GWLANY,GWSFLA,GWSDLA)
DDFGROUP SANDIEGO,LIST=(SASD*,GWATSD,GWSDNY,GWSFSD,GWSDLA)
DDFGROUP SANFRAN,LIST=(SASF*,GWATSF,GWSFNY,GWSFSD,GWSFLA)
DDFGROUP NEWYORK,LIST=(SANY*,GWATNY,GWSFNY,GWSDNY,GWLANY),
DDFGROUP NEWYORK,LIST=(IMSNY1,IMSNY2,IMSNY3)
DDFGROUP ATLANTA,LIST=(SAAT*,GWATNY,GWATSF,GWATSD,GWATLA),
                LIST=(CICSAT1,CICSAT2)
```

Some of the DDFRES control file entries that the EZLEAC11 program creates from the above example are:

```
DDFRES SALA*,GROUP=(LA)
DDFRES GWATLA,GROUP=(LA,ATLANTA)
DDFRES GWLANY,GROUP=(LA,NEWYORK)
DDFRES GWSDLA,GROUP=(LA,SANDIEGO)
DDFRES GWSFLA,GROUP=(LA,SANFRAN)
```

In this example, SALA* is defined in group LA and SALACICS is defined in SANDIEGO. Therefore, when SALACICS is added to DDF, it is displayed under the SANDIEGO group only, not under the LA group. However, if SALACICS is explicitly defined in LA, then SALACICS is added to DDF under both SANDIEGO and LA.

In this example, the Gateway nodes (GWsa1sa2) are defined in both of the cities they are connecting. Each city has a subarea associated with it by naming convention; therefore defining SAsa_id* is sufficient to assign all resources in the city to the city status panel. As a result, gateways are displayed in several city panels as shown in Figure 20 on page 91. NEWYORK and ATLANTA are also responsible for associated applications shown in Figure 20 on page 91.

```
EZLPNLNY                                        PAGE 1 OF 1
                   NEW YORK CITY NETWORK STATUS

   GWATNY             GWLANY
```

```
EZLPNLAT                                               PAGE 1 OF 1
                   ATLANTA CITY NETWORK STATUS

   GWATLA             GWATNY
```

Figure 20. NEWYORK and ATLANTA Groups

Defining DDF Groups

The following sample definitions are based on the DDFGROUP control file entries shown in Figure 20. These definitions are located in DSIPARM.

Before you create DDF groups, consider your network and how you want the DDF panels to display. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* to code the DDFGROUP control file entries.

Updating the EZLTREE DSIPARM Member

To update EZLTREE, add DSIPARM member *group_name* to the EZLTREE member. Use a level 3 element that is not subordinate to NETWORK, so the same message is not displayed in MESSAGEVIEW multiple times (one for each resource type and DDF group). The following example tree is valid:

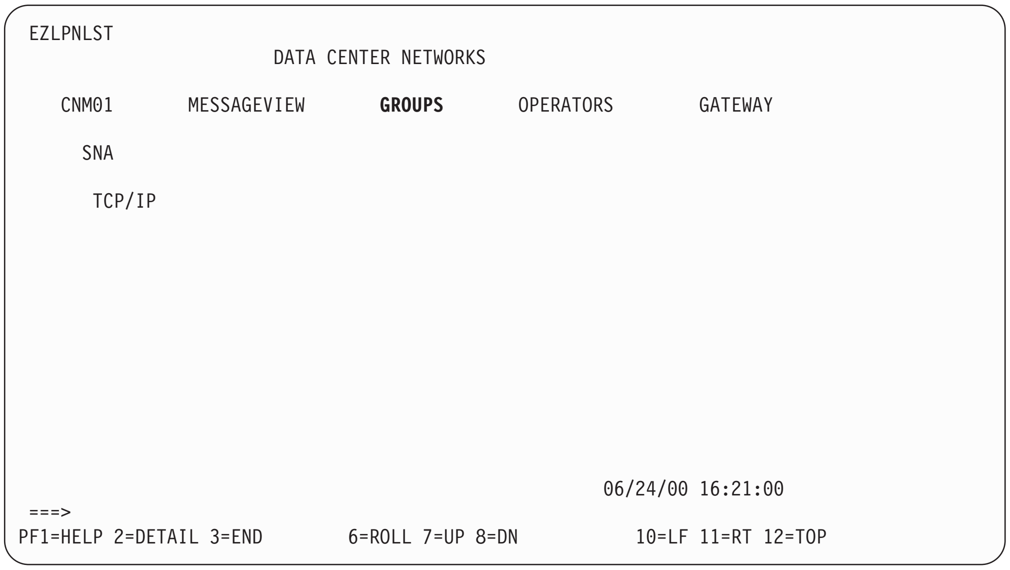
```
/*   NETWORK : CNM01                          */
1 CNM01
  2 SYSTEM
    3 GATEWAY
    3 GROUPS
      4 CALIF
        5 LA
        5 SANFRAN
        5 SANDIEGO
      4 NEWYORK
      4 ATLANTA
    3 OPID
      4 OPER1
    3 NETWORK
      4 RESOURCE
      4 SNA
        5 SA
          6 NCP
          6 LINE
          6 LINKSTA
          6 CDRM
          6 CDRSC
          6 PU
          6 LU
          6 SESSION
          6 APPL
          6 ERR
        5 APPN
          6 CP
          6 EN
        5 X25
          6 X25MCH
          6 X25PU
```

Figure 21. Example EZLTREE Member

Updating DDF Menus

To merge the new DDF panels into existing DDF panels, update the main panel menu, EZLPNLST, where you see CNM01, MESSAGEVIEW, and GATEWAY.

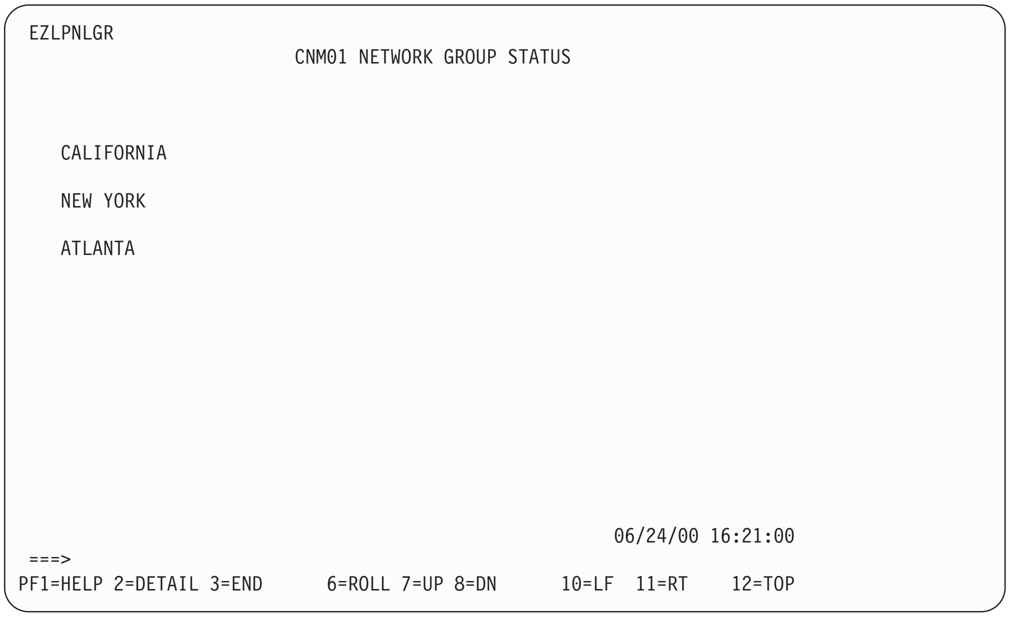
EZLPNLST is shown in Figure 22 on page 93.



```
EZLPNLST
                       DATA CENTER NETWORKS

   CNM01      MESSAGEVIEW      GROUPS      OPERATORS       GATEWAY

     SNA

      TCP/IP













                                                      06/24/00 16:21:00
===>
PF1=HELP 2=DETAIL 3=END       6=ROLL 7=UP 8=DN          10=LF 11=RT 12=TOP
```

Figure 22. EZLPNLST Panel with DDF Group

EZLPNLGR displays the Network Group Status Panel shown in Figure 23:



```
EZLPNLGR
                         CNM01 NETWORK GROUP STATUS



   CALIFORNIA

   NEW YORK

   ATLANTA











                                                       06/24/00 16:21:00
===>
PF1=HELP 2=DETAIL 3=END      6=ROLL 7=UP 8=DN      10=LF  11=RT    12=TOP
```

Figure 23. EZLPNLGR Panel Showing a List of Cities

To view the CALIFORNIA subgroups, use the EZLPNLCA indicator panel shown in Figure 24 on page 94.

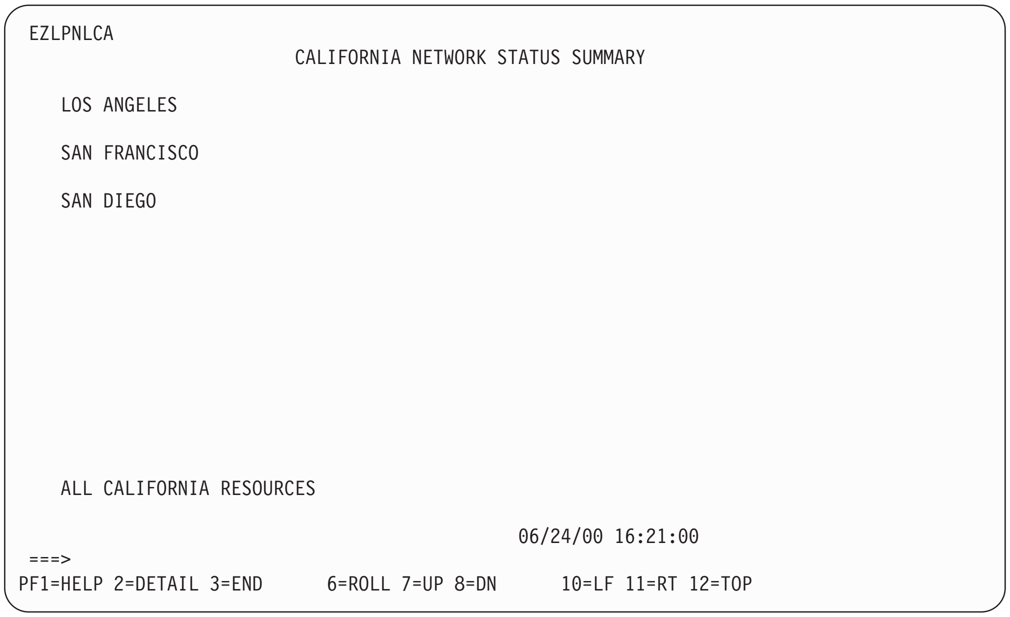

```
EZLPNLCA
                      CALIFORNIA NETWORK STATUS SUMMARY

   LOS ANGELES

   SAN FRANCISCO

   SAN DIEGO











   ALL CALIFORNIA RESOURCES

                                           06/24/00 16:21:00
===>
PF1=HELP 2=DETAIL 3=END      6=ROLL 7=UP 8=DN      10=LF 11=RT 12=TOP
```

Figure 24. EZLPNLCA Panel for CALIFORNIA Group

Creating Generic Display Panels for DDF Groups

Creating a generic panel for each new group, enables operators to see resources saved under them. The following is a generic panel:

```
/*******************************************************************/
/* DEFINE CNM01 NETWORK STATUS PANEL                               */
/*  NEWYORK       STATUS DISPLAY                                   */
/*                                                                 */
/*******************************************************************/
/* APAR#        DATE                DESCRIPTION                    */
/* ---------- --------  ------------------------------------------ */
/*                                                                 */
/*******************************************************************/
P(EZLPNLNY,24,80,EZLPNL2,EZLPNL2, ,)
TF(01,02,09,T,NORMAL)
TT(EZLPNLNY)
TF(02,21,59,WHITE,NORMAL)
TT(CNM01 NEW YORK CITY NETWORK STATUS)
TF(01,65,77,BLUE,NORMAL)
TT(PAGE 1 OF 1)
SF(CNM01.NEWYORK,04,05,16,N, , ,01)
ST( )
SF(CNM01.NEWYORK,04,25,36,N, , ,02)
ST( )
SF(CNM01.NEWYORK,04,45,56,N, , ,03)
ST( )
⋮
TF(24,01,52,T,NORMAL)
TT(PF1=HELP 2=DETAIL 3=END 4=DIS 5=CY 6=ROLL 7=UP 8=DN)
TF(24,53,79,T,NORMAL)
TT( 9=DEL 10=LF 11=RT 12=TOP)
EP
/******************************************************************/
```

The generic group panels for ATLANTA, SANDIEGO, LA, and SANFRAN look just like this one for CALIFORNIA except all occurrences of NEWYORK would be changed to the correct group name and the name of the panel would be updated.

Updating the EZLPNLST CNMPNL1 Member

To improve DDF performance, include new panels created for DDF groups in the EZLPNLS member of the CNMPNL1 data set for preloading. The DDF group sample panels provided with AON in the CNMPNL1 data set are:

- EZLPNLAT
- EZLPNLCA
- EZLPNLCI
- EZLPNLGR
- EZLPNLLA
- EZLPNLNY
- EZLPNLSF

Chapter 5. Issuing Dynamic Display Facility (DDF) Commands

AON routines use these commands to update the DDF status information from within DDF. If additional status information is required, use the following commands to update the DDF status information:

DDF Displays DDF or a particular DDF panel

DDFADD
Adds a status descriptor to a component

DDFCLEAR
Clears DDF

DDFDEL
Deletes a status descriptor from DDF

DDFPANEL
Loads a panel member

DDFQRY
Queries the status of specific status descriptors

DDFTREE
Loads a tree member

MARK
Marks a DDF resource with an operator ID

UNMARK
Removes an operator ID from a DDF resource

Using the Dynamic Display Facility (DDF)

Purpose

The DDF command shows a color-coded status panel for the resources that are currently being acted upon by AON or require operator intervention for recovery. You can also use the DDF command to display a specific DDF panel.

Syntax

DDF

```
►►──DDF──┬────────────┬──────────────────────────────────────────────►◄
         └─panel_name─┘
```

Parameters

panel_name
The name of the panel displayed in the upper left corner of the screen. Use this parameter to view a specific DDF panel.

Usage

- The workstation from which you enter the DDF command must support 3*x*79 Terminal Extended Attributes, which are blue, red, pink, green, turquoise, yellow, and white for color and blink, reverse video, and underscore for highlighting.
- If you enter **DDF** without the *panel_name* parameter, the main DDF panel is displayed. (The panel name for this panel is EZLPNLST.)
- The DDF command operates in full-screen mode only.

Example

To display the panel named FKVPNSNA when AON/SNA is installed, type the following:

```
DDF FKVPNSNA
```

Adding Status Descriptors (DDFADD)

Purpose

The DDFADD command issues a request to the EZLTDDF task to add a status descriptor to a status component with data supplied by a calling program, a command list, or NetView command facility (NCCF) operator. The date and time are provided automatically.

Syntax

DDFADD

```
                                              ┌─────────────────────┐
                                              ▼                     │
►►──DDFADD──root_comp──┬────────────┬─┬────────────┬─┬─────────────────┬┴──────►◄
                       └─.stat_comp─┘ └─(def_comp)─┘ └─,keyword=value──┘
```

Note: You can specify more than one *keyword=value* pairs.

Parameters

root_comp
: The root component name that is defined in the root node of the tree structure. The root component is required because different systems can have status components with the same name defined in their respective tree structures. The root component must be unique, therefore, each status component in a tree structure can be uniquely identified by prefixing it with the root component entry.

stat_comp
: A valid resource name or resource type, as defined in the EZLTREE member, which can contain up to 8 characters.

def_comp
: The element in the DDF tree that organized DDF descriptors into groups. This element is usually a resource type, service point name, or group name defined in DDFGROUP control file entries. For example, you can define CNM01.LINE99(LINE) where CNM01 is the *root_comp*, LINE99 is the *stat_comp*, and LINE is the *def_comp*.

keyword=value
: The status information that is necessary to add a status descriptor. In general, the only keywords that are needed are reference value, priority, and data. Valid values are:

  RefValue= *value*
  : Specifies reference value, which must be alphanumeric, with a maximum length of 20 (for example RV=NCP01).

  INfo= *text*
  : Specifies the information displayed on DDF status panel in the STATUSTEXT field with a maximum length of 80 alphanumeric characters. The text must be delimited. Delimiters can be any unique character that does not occur in the text. The length of the text field must be within the range specified by the start and end positions in the corresponding STATUSFIELD entry. See "Locating the Status Component (STATUSFIELD)" on page 60 for more information.

PRiority= *value*
Specifies a valid number within the range specified in the EZLINIT file. If the field is not specified, a program default priority of 999 is used.

COlor = {Red | Blue | Turquoise | Green | Pink | Yellow | White}
Specifies color. If this is not specified, color is based on priority.

HighL = {Normal | Blink | Reverse | Underscore | Panel}
If this is not specified, highlighting is determined by the panel definition.

PropUp = {Yes | No}
Specifies propagation upward. If this is not specified, propagation up is governed by the entry in the EZLINIT file.

PropDwn ={Yes | No}
Specifies propagation downward. If this is not specified, propagation down is governed by entry in the EZLINIT file.

ProplvLU = {* | *root_comp.stat_comp***}**
An asterisk (*) specifies that the level to which the status is to be propagated is the root of the tree. If a status component is specified, the status is only propagated up to, and including, the specified status component.

ProplvLD = {* | *root_comp.stat_comp***}**
An asterisk (*) specifies that the status is to be propagated to the leaves of the tree. If a status component is specified, the status is only propagated down the leaves until, and including, the specified status component.

DataType = {OTH | MSG}
MSG specifies that message data is to be displayed on the status descriptor. OTH specifies that the data field contains user defined data.

DAta =*text*
Specifies that text can be user or message data with a maximum length of 240 characters. Data can be composed of one or more lines. Each line of data can be delimited to produce a formatted display. Delimiters can be any unique character that does not occur in the text. Delimiters between lines must be doubled. For example:

```
DA=#LINE1-DATA #### LINE2-DATA #### LINE3-DATA #
```

Causes the following to display on the status descriptor data field:

```
LINE1-DATA
LINE2-DATA
LINE3-DATA
```

Usage

If the data supplied in the DDFADD command exactly matches an existing descriptor in the chain, the new descriptor is not added.

With AON, status changes are logged in the automation log. The AON common logging routines provide the data for the DDFADD command and issue the DDFADD command. Any resource that is monitored by AON is automatically updated. User applications can also call the common logging routines to add DDF descriptors. The logging routines refer to the control file for status and priority information. See Chapter 2, “Understanding Dynamic Display Facility (DDF) Design,” on page 15 for more details.

Example

```
DDFADD CNM01.NCP001(NCP),RV=NCP001,PR=550,DT=MSG,
       DA='EZL509I NCP001 IS UNAVAILABLE (REPORTED BY AUTNET1)'
```

In this example, a status descriptor is added for NCP001 on CNM01 with a priority of 550. NPC001 is green on the status panel because priority 550 is in the green color range.

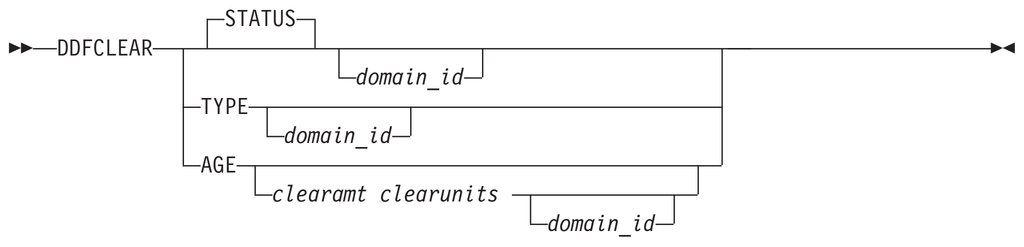
Clearing DDF (DDFCLEAR)

Purpose

The DDFCLEAR command deletes DDF elements based on resource. DDFCLEAR is a synonym for EZLEADCL.

Syntax

DDFCLEAR



Parameters

STATUS
Deletes records based on VTAM status. If you issue DDFCLEAR with no parameters, the default command issued is:

```
DDFCLEAR STATUS current_domain_id
```

STATUS = DDF records are deleted based on the VTAM status of the resource in the DDFname, in the format *domainid.resname(restype_generic)*. The resource is displayed with a D NET command. If the resource cannot be displayed, the DDF element is *not* deleted. If the resource cannot be displayed, AON assumes the resource is unavailable such as NCPs and switched major nodes.

If the resource status matches a DDF status, that DDF element is deleted. If the resource has REQ=NOADD defined for it, the wild cards in the ENVIRON DDF statements are evaluated. For example, AON default DDF statements provide for status of ACT* and CON* as REQ=NOADD. If DDFCLEAR were run and some LUs were found among the DDF elements that now had an active status (because of activating the PU,SCOPE=U), the LUs are deleted from DDF.

TYPE
Deletes records based on resource type. TYPE = DDF records are deleted based on the VTAM resource type of the resource in the DDFname (usually in the format *domainid.resname(restype_generic)*. The resource is displayed with a D NET command. If the resource cannot be displayed, the DDF element is *not* deleted. If the resource is assumed to be nondisplayable, a problem is indicated such as NCPs and switched major nodes. If the resource type matches a DDF type that has REQ=NOADD defined for it, the DDF element is deleted. Wild cards in the ENVIRON DDF statements are evaluated.

For example, AON default DDF statements provide for type of LU as REQ=NOADD. If DDFCLEAR were run and some LUs were found among the DDF elements that had *any* status, the LUs are deleted from DDF.

AGE
Deletes elements from DDF based on the age of the DDF element. A date and

time stamp are stored into DDF when an element is added to DDF. This date and time are compared to the current date and time. If the difference exceeds the amount of DAYS or HOURS specified, the record is deleted. If you specify AGE with no other parameters, then the following command is issued:

```
DDFCLEAR AGE 5 DAYS current_domain_id
```

domain_id
The NetView domain ID to be evaluated for extraneous elements. The domain ID must match one of the level 1 values in EZLTREE. For a single domain DDF, this is usually the current domain ID. Check the value of the control file entry ENVIRON SETUP SYSNAME to determine this value. For a focal-point DDF representing several NetView domains, this value can be the EZLTREE root name or the ENVIRON SETUP SYSNAME value set up on any of the distributed systems. If no domain ID is provided, the current NetView domain ID is used.

clearamt
The number of days or hours to be used for an age threshold for deleting DDF records in long-lived NetView systems. This number must be a whole number. If you are deleting records by hours of age, the number is in the range of 0 — 24. If you are deleting by days, any number is valid up to 999. Because all DDF elements are kept in storage, they do not survive a recycle of NetView. For this reason, the AGE option is useful only in environments where NetView has continuous availability for more than a week. If you issue DDFCLEAR AGE with no other parameters, the default value used is 5 days.

clearunits
Either DAYS or HOURS. All records whose DDF date is older than *clearamt* DAYS or *clearamt* HOURS is deleted. If no value is specified, DAYS is the default. If you specify HOURS, also specify a *clearamt* value because the parameters are positional.

Usage

Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information about the ENVIRON DDF control file entries.

Example

To clear all DDF records based on status, issue:

```
DDFCLEAR
```

Deleting Status Descriptors (DDFDEL)

Purpose

The DDFDEL command deletes status descriptors. Each status descriptor in the chain is compared against the data specified on the DDFDEL command. If each specified element in the command matches the data, the status descriptor is removed from the chain. The parameters supplied with the DDFDEL command can include wildcard characters. An asterisk (*) takes the place of a single character or, if used at the end of the field, indicates that the rest of the string should be automatically matched. If a keyword is not specified on the command, it is considered to be matched by any other value.

Syntax

DDFDEL

```
                                                    ┌──────────────────┐
                                                    ▼                  │
►►──DDFDEL──root_comp──┬────────────┬──┬────────────┬──┬────────────────┬┴──────►◄
                       └─.stat_comp─┘  └─(def_comp)─┘  └─,keyword=value─┘
```

Note: You can specify more than one *keyword=value* pairs.

Parameters

root_comp
: The root component name that is defined in the root node of the tree structure. The root component is required because different systems can have status components with the same name defined in their respective tree structures. Because the root component must always be unique, each status component in a tree structure can be uniquely identified by using a prefix with the root component entry.

stat_comp
: Valid resource name or resource type that is defined in the EZLTREE member up to 8 characters.

def_comp
: The element in the DDF tree that organized DDF descriptors into groups. This element is usually a resource type, service point name, or group name defined in DDFGROUP control file entries. For example, you can define CNM01.LINE99(LINE) where CNM01 is the *root_comp*, LINE99 is the *stat_comp*, and LINE is the *def_comp*.

keyword=value
: Describes the status information that is necessary to delete a status descriptor. Valid values are:

  PropDwn ={Yes | No}
  : Specifies propagation downward. If this is not specified, propagation down is governed by entry in the EZLINIT file.

  RefValue= *value*
  : Specifies a reference value, which must be alphanumeric, with a maximum length of 20 characters (for example RV=NCP001).

INfo= *text*
: Displays the information in the STATUSTEXT field, with a maximum length of 80 alphanumeric characters. The text must be delimited. Delimiters can be any unique character that does not occur in the text.

PRiority= *value*
: Specifies the priority, which must be a valid number within the range specified in the EZLINIT PRI entry.

COlor = {Red | Blue | Turquoise | Green | Pink | Yellow | White}
: Specifies a color.

HighL = {Normal|Blink|Reverse|Underscore|Panel}
: Specifies highlighting. If highlighting is specified in the DDFDEL command, it must be the same as that of the existing status descriptors, otherwise they are not deleted. Let highlight default, because it is considered to be matched by any other value.

SOurce= *value*
: Specifies the operator under whom the DDFADD request was issued. This is the REPORTER field on the Detail Status Display panel.

DataType = {OTH|MSG}
: MSG specifies that message data in the status descriptor is in message format. OTH specifies that the data field contains user defined data.

DAta =*text*
: Specifies user or message data with a maximum length of 240 characters.

Usage

Use a wildcard character (*) with a single DDFDEL command to delete multiple status descriptors.

Example

In this example, any status descriptor for NCP001 on CNM01 with a reference value of NCP001 is deleted. Because no other keywords are used, no other criteria are used to determine a match:

```
DDFDEL CNM01.NCP001,RV=NCP001
```

Example

In this example, any status descriptors for NCP001 on CNM01 that have a reference value in the range of 100–190 are deleted:

```
DDFDEL CNM01.NCP001,RV=1*0
```

Example

In this example, any status descriptors for NCP001 on CNM01 that have a reference value beginning with R and a priority beginning with the number 3 are deleted.

```
DDFDEL CNM01.NCP001,RV=R*,PR=3*
```

Loading a Panel Member (DDFPANEL)

Purpose

The DDFPANEL command dynamically loads a panel member from the DSIPARM data set or deletes a panel member.

Syntax

DDFPANEL

```
►►──DDFPANEL──panel──┬─ADD────┬─────────────────────────────────────────►◄
                     └─DELETE─┘
```

Parameters

panel
: The name of the member the contains the panel to be loaded. The panel name and the member name must match.

Usage

When DDF is started, only the EZLPNLS panel definitions are loaded. Panels loaded with the DDFPANEL command are not reloaded during EZLTDDF initialization. If you add panels dynamically, restart DDF, Add the panels again. If you update a panel and want the updated version to be displayed by DDF, use the DDFPANEL command to replace the current copy of the panel.

Example

The following command loads member NEWPANEL into memory, which gives you access to the panel defined in this member:

```
DDFPANEL NEWPANEL,ADD
```

Querying Status Descriptors (DDFQRY)

Purpose

The DDFQRY command queries the status of specific status descriptors. Parameters specified with the DDFQRY command can include wildcard characters. Asterisks (*) take the place of a single character or, if used at the end of the field, indicate that the rest of the string are automatically matched. If a keyword is not provided on the command, any value is considered a match.

Syntax

DDFQRY

```
                                                    ┌──────────────────┐
                                                    ▼                  │
►►──DDFQRY──root_comp──┬────────────┬──┬────────────┬───┬────────────────┬┴──────►◄
                       └─.stat_comp─┘  └─(def_comp)─┘   └─,keyword=value─┘
```

Note: You can specify more than one *keyword=value* pairs.

Parameters

root_comp
: The root component name that is defined in the root node of the tree structure. The root component is required because different systems can have status components with the same name defined in their respective tree structures. Because the root component must be unique, each status component in a tree structure can be uniquely identified by using a prefix with the root component entry.

stat_comp
: Valid resource name or resource type (*def_comp* value) that is defined in the EZLTREE member. You can use up to 8 characters.

def_comp
: The element in the DDF tree that organized DDF descriptors into groups. This element is usually a resource type, service point name, or group name that is defined in DDFGROUP control file entries. For example, define CNM01.LINE99(LINE) where CNM01 is the *root_comp*, LINE99 is the *stat_comp*, and LINE is the *def_comp*.

keyword=value
: Describes the status information that can be used to query status descriptors. Valid values are:

  RefValue = *value*
  : Specifies reference value, which must be alphanumeric, with a maximum length of 20 characters (for example, RV=NCP001).

  INfo = *text*
  : Specifies information text, which must be alphanumeric, with a maximum length of 80 characters. The text must be delimited. Delimiters can be any unique character that does not occur in the text (for example, IN='TAPE001').

PRiority = *value*
Specifies the priority, which must be a valid number within the range specified in the EZLINIT entry PRIORITY (for example, PR=330).

COlor = {Red | Blue | Turquoise | Green | Pink | Yellow | White}
Specifies color. Status descriptors with the specified color are displayed if all other keyword values match.

HighL = {Normal|Blink|Reverse|Underscore|Panel}
Specifies highlighting. Status descriptors with the specified highlighting are displayed if all other keyword values match.

SOurce = *value*
Specifies the operator ID that issued the DDFADD command. The ID can be a maximum length of 8 alphanumeric characters. This value is displayed in the status descriptor field.

DataType = {OTH|MSG}
Status descriptors with the specified data type value are displayed if all other keyword values match.

DAta = *text*
Status descriptors with the same data text are displayed if all other keyword values match.

Usage

Use a wildcard character with a single DDFQRY command to view multiple status descriptors. AON uses DDFQRY to query DDF status information so that it can be forwarded from a distributed domain to a focal-point domain.

Example

In this example, status descriptors for NCP001 on CNM01 with a reference value of NCP001 are displayed:

```
DDFQRY CNM01.NCP001,RV=NCP001
```

Because no other keywords are used, an automatic match is assumed.

Example

In this example, status descriptors for NCP001 on CNM01 that have a reference values in the range of 100 — 190 are displayed:

```
DDFQRY CNM01.NCP001,RV=1*0
```

Example

Display all status descriptors saved with a *def_comp* value of NCP:

```
DDFQRY CNM01.NCP
```

Example

Display all status descriptors for the system CNM01:

```
DDFQRY CNM01
```

Loading Tree Members (DDFTREE)

Purpose

The DDFTREE command dynamically loads a tree member from the DSIPARM data set or deletes a tree member from storage.

Syntax

DDFTREE

```
►►──DDFTREE──tree──┬─ADD────┬──────────────────────────────────────────────►◄
                   └─DELETE─┘
```

Parameters

tree
The name of the member that contains the tree structure to be loaded

Usage

The tree member can refer to other tree members with the %INCLUDE keyword. When a new tree is loaded to replace the existing tree, status descriptors that have similar *leaf* names in both trees are copied to the new tree.

When DDF is started, only the EZLPNLS panel definitions are loaded. Panels loaded with the DDFPANEL command are not reloaded during EZLTDDF initialization. If you add panels dynamically and restart DDF, add the panels again.

The DDFTREE command adds trees at the 01 or root level. Trees added exist with other trees in the EZLTREE member, unless the tree added has the same root as one that already exists. If the tree being added already exists in DDF, the current tree is replaced by the new one. You can replace only complete trees.

The member name of the tree and root of the tree must be the same for the DDFTREE command to replace a tree.

Example

The following command loads member NEWTREE into memory, which gives you access to the tree structure defined in this member:

```
DDFTREE NEWTREE,ADD
```

Assigning a Problem to an Operator in DDF (MARK)

Purpose

The MARK command assigns a DDF entry to an operator. Specify the data used to identify the DDF entry and the ID of the operator to be assigned to the entry.

Syntax

```
►►──MARK──root_comp.rv(opid)──────────────────────────────────────────►◄
```

Parameters

root_comp
: The root component name that is defined in the DDF entry to be assigned

rv
: The resource name that is displayed in the RefValue field of the DDF entry to be assigned

opid
: The ID of the operator to whom this entry is to be assigned

Usage

The *root* and *rv* parameters are required to issue this command from a command line. If the *opid* parameter is not specified, DDF assigns the entry to the operator ID issuing the MARK command.

If the entry to be signed out is already signed out no action is taken. Before attempting to reassign the entry to another operator, issue the UNMARK command. When assigned, a resource remains assigned during recovery monitoring, as long as the operator who marked the resource is logged on. If the operator assigned to the resource logs off, the next recovery monitoring timer causes the resource to be unassigned.

Example

To assign the DDF entry for NCP001 under the domain CNM01 to the operator OPER1, issue:

```
MARK CNM01.NCP001(OPER1)
```

Removing an Operator Assignment in DDF (UNMARK)

Purpose

The UNMARK command removes a DDF assignment entry from the specified operator. The data used to identify the DDF entry and the ID of the operator to be removed must be specified.

Syntax

UNMARK

```
►►──UNMARK──root_comp.rv(operator_id)──────────────────────────────────►◄
```

Parameters

root_comp
The root component name that is defined in the DDF entry to be unmarked

rv The resource name that is displayed in the RefValue field of the DDF entry to be unmarked

operator_id
The operator ID assigned to this DDF entry

Usage

- The *root* and *rv* parameters are required. If you do not specify the *operator_id* parameter, the UNMARK command uses your operator ID as the default.
- If you issue the UNMARK command for a DDF entry that is not assigned to an operator, the UNMARK command takes no action.
- Each automation function has a syntax for specifying the name of the resource to be displayed (RV).

Example

To remove the operator ID, OPER1, from the DDF entry NCP001 under CNM01:

```
UNMARK CNM01.NCP001(OPER1)
```

Part 3. Customizing AON

Chapter 6. Creating Customized Procedures

Before you begin to write automation procedures for your network, become familiar with writing and interpreting NetView command list programs. Refer to *IBM Tivoli NetView for z/OS Programming: REXX and the NetView Command List Language* for more information.

AON automation functions enable you to build and expand network automation. AON automation functions provide selected recovery routines and the ability to expand the recovery using common routines. To extend the automation capability functions of AON automation you can write programs or extend control file definitions. You can write extensions to:

- Check the status of network components using VTAM commands before taking action.
- Perform variable substitution for commands and replies with information obtained from the incoming message or from additional solicited information.
- Check automation settings for a resource, resource type, or network before taking action.
- Check specific error codes and take corrective action depending on the error code.
- Coordinate multiple independent messages into a single automated response.
- Create specialized operator dialogs.
- Check thresholds for events in a specified interval.

Interface user-written extensions with the common routines in AON when possible. Common routines provide the following benefits:

- Less code has to be written, reducing the development time
- Portability of the code if all installation unique information is maintained in the control file
- Consistent network management interface

Also note the following functions and features:

- Messages with HDRMTYPE='Y' are sent directly to the system console and cannot use the automation by the program operator interface (POI) to NetView. To circumvent this, use the SSI interface.
- Unsolicited VTAM messages sent to the operating system console (such as IST931I) are also sent to NetView by the POI if the PPOLOG start option is in effect. Message automation occurs when messages enter the NetView address space through the SSI task or through an operator task.
- You must define a subsystem interface (SSI) address space for the NetView component on which AON is running. This enables AON to submit jobs for log maintenance, and to respond to console messages other than those from NetView. When you define the SSI, check your message processing facility list (MPFLST) in PARMLIB and ensure that all messages you want to automate can pass to and from NetView.

How Programs Use AON Control File Routines

The common routines enable a user-written program the capability to interface to the control file, status file, and log file with a minimum amount of coding. Functions, such as determining whether automation is available from the control file, are supported through the common routines.

To invoke a program that performs automated functions, use one of the following methods:
- Issue the program from the NetView automation table.
- Have the operator enter the program name or a synonym for the program.
- Have a higher level program call a lower level program.
- Issue a program with a timer.
- Issue a program with the NetView EXCMD command.

Invoking a program from the NetView automation table is commonly used for passive monitoring.

How a program is invoked and what function the program performs determines which AON routines the program calls. This section contains information that is applicable to all programs written to use the AON common routines, but the format and description is most applicable to programs which are invoked from the NetView automation table. The basic AON program:
- Performs program initialization processing.
- Checks recovery automation.
- Performs program unique processing such as THRESHOLDING and MONIT.
- Notifies operators of intervention required.
- Logs automation activity.

See Figure 25 on page 117 for the basic AON program flow.

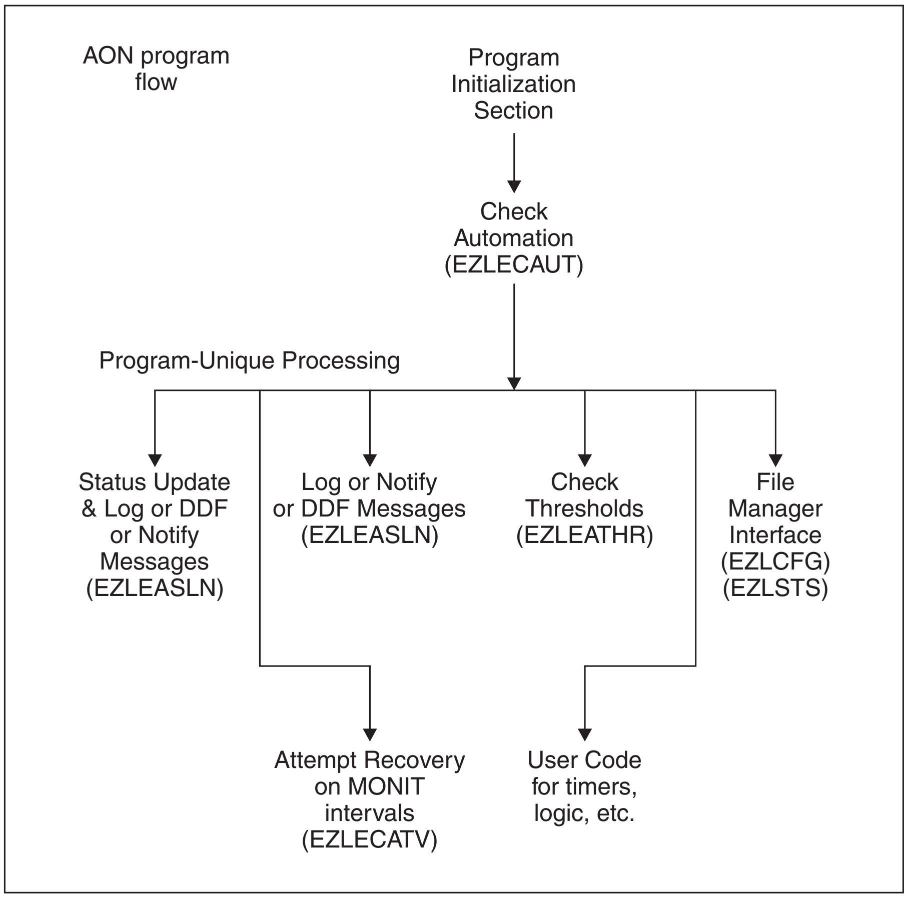

AON program flow
Program Initialization Section
Check Automation (EZLECAUT)
Program-Unique Processing
Status Update & Log or DDF or Notify Messages (EZLEASLN)
Log or Notify or DDF Messages (EZLEASLN)
Check Thresholds (EZLEATHR)
File Manager Interface (EZLCFG) (EZLSTS)
Attempt Recovery on MONIT intervals (EZLECATV)
User Code for timers, logic, etc.

Figure 25. Basic AON Command List Flow

Performing Program Initialization Processing

Initialization processing:

- Identifies the program with an &IDENT=*name* variable.
- Declares the common global variables (CGLOBALs) and task common global variables (TGLOBALs) that are used.
- Issues debugging messages, if AONTRACE is turned on.
- Validates the program was properly invoked.
- Forces the program to be run under a specific operator.
- Saves the NetView message parameters in case the program uses the NetView WAIT statement.

These tasks are not required in user-written programs. However, to perform complex processing logic or to simplify the coding process, you might need to perform several of these housekeeping routines.

The identify step simplifies the coding of the message logging and notification routines. Declaring task global variables (TGLOBALs) and common global variables (CGLOBALs) is necessary if you need to use any of them. The AONTRACE function is useful in problem determination. Validating that the command was properly issued is useful to stop the operator from accidentally running the program. The validation can also be accomplished through NetView command authorization. If you use the NetView WAIT statement and still want to access the original message text or control information, save the variables.

See the coding in "Sample AON Extended Module" on page 119, the supplied extended programs, or the *IBM Tivoli NetView for z/OS Programming: REXX and the NetView Command List Language* for further information about coding the initialization sections.

Determining If Automation Is Available

This step must always be performed by programs which are invoked from the automation table. The step is accomplished by calling the `EZLECAUT` common routine. The routine checks the `RECOVERY` policy definitions to make sure the automation flags enable automation. These checks eliminate the risk of automating messages for resources that should not be automated or for which automation is turned off.

Performing Program Unique Logic

The program unique logic can be any combination of AON common routines and user-written code. The requirements to be met and the functions to be performed determine the structure and content of the program. Several possible common routines and user-written code sections are:

- Activating resources
- Starting resource monitoring with or without reactivation attempts
- Logging messages and sending notifications
- Checking threshold values
- Interfacing with the file manager
- Writing user code for:
  - Issuing inquiries and checking answers
  - Setting common global variables (CGLOBALs) and task global variables (TGLOBALs) to control processing
  - Setting timer delays for reinitiating processing

Activating resources

You can activate VTAM resources by issuing an AON common routine, EZLEVACT.

The routine is necessary when an INACTIVE message is received and a user-written program is handling the message. VTAM commands or NetView commands can be used to assist in this.

Recovery and reminder monitoring

You can use recovery and reminder monitoring by issuing an EZLECATV or EZLESRMD AON common routine. These routines use the `MONIT` policy definitions. The EZLECATV routine starts monitoring the resource status and, if necessary, tries to recover the resource. The EZLESRMD routine monitors the resource and notifies operators, but does not start recovery.

Updating status, DDF, logs, or sending notifications

You can update status, DDF, logs, or send notifications by invoking the EZLEASLN common routine. The EZLEASLN common routine also generates alerts, based on your `NOTIFY` policy definitions.

This routine logs a message to the automation log (NLOG), DDF, and the NetView log (NETLOG). If you specify STATUS=YES, the status file is updated with the current automation status and acting operator. If you specify NOTIFY=YES on the EZLEASLN invocation, an operator notification is sent to all notification operators.

Checking thresholds

You can check thresholds, defined with the `THRESHOLD` policy definition, by invoking an EZLEATHR AON common routine.

This routine is used if it is necessary to track and maintain a threshold count. A threshold is used to change the recovery action based upon the threshold level that was exceeded. The common routine also records the current date and time as a new error to the status file.

Interfacing with the file manager

You can interface with the file manager by using the file manager interface commands.

The commands are used if you need to access uniquely defined entries in the control file or want to directly inquire or update the status file.

Several file manager interface commands exist. See Chapter 7, “Using AON Command Processors,” on page 123 for more information.

User code for issuing inquiries and checking answers

You can write user code to issue inquiries and check answers by using NetView or z/OS commands to check the value or status of some non-VTAM owned resource, system component, or subsystem before continuing.

Refer to the WAIT command in *IBM Tivoli NetView for z/OS Programming: REXX and the NetView Command List Language* for more information.

User code for setting CGLOBALs and TGLOBALs to control processing

You can write user code for setting CGLOBALs and TGLOBALs to control processing by using NetView commands to set a flag indicating progress, message counts, and other various indicators that must be kept from one occurrence of a message or event to the next.

Refer to the discussion of CGLOBALs and TGLOBALs in *IBM Tivoli NetView for z/OS Programming: REXX and the NetView Command List Language* for more information.

User code for setting timer delays for reinitiating processing

You can write user code for setting timer delays to reinitiate processing by using NetView commands.

Use this code when a program must reissue itself or another program after a given time period to perform additional processing. One example is in the active monitoring of failed network resources.

Refer to the discussion of AT, AFTER, and DELAY commands in the *IBM Tivoli NetView for z/OS Command Reference Volume 1* for more information.

Sample AON Extended Module

This section describes the AON extended module that tries to recover the resource name that is passed to it. The module uses a subset of the AON common routines. The notes following the example refer to portions of the module and the AON common routines that are described in “How Programs Use AON Control File Routines” on page 116.

```
/*******************************************************************/
/*                                                                 */
/*  (C) Copyright IBM Corp 1997, 2001. All rights reserved.        */
/*                                                                 */
/*******************************************************************/
/*                                                                 */
/*     DESCRIPTION:  THIS CLIST WILL ATTEMPT TO RE-ACTIVATE THE FAIL */
/*                    RESOURCE.                                      */
/*     WHERE CALLED: INVOKED FROM THE MESSAGE TABLE BY USER CODED    */
/*                    MESSAGE TABLE ENTRY SENDING RESOURCE NAME ONL */
/*                                                                   */
/*   ITS PURPOSE IS TO REACTIVATE THE RESOURCE AUTOMATICALLY.  IT    */
/*   ALSO INFORMS NCCF ALERT OPERATORS IF THE RESOURCE CAN NOT BE    */
/*   ACTIVATED.  IT WILL ALSO CHECK THRESHOLDS SET BY THE CUSTOMER   */
/*   TO INFORM THE ALERT OPERATORS OR TERMINATE RECOVERY.            */
/*                                                                   */
/*-------------------------------------------------------------------*/

 trace off

 Parse source . invok ident .
 parse upper arg ArgString

 Parms = ArgString

/*-------------------------------------------------------------------*/
/* Entry Trace Call                                                  */
/*-------------------------------------------------------------------*/
 1  'GLOBALV GETC EZLTRACED EZLTRACEO.'Opid()||,/* Trace Variable */
             ' NETOPER NETOPER2 BASEOPER'
If Substr(EZLTRACED,1,4) <> 'NONE' Then  /* If not NONE ...    */
  Do
 2    'EZLTRACE ENTRY 'ident argstring                 /* Entry trace  */

   interpret 'trace' EZLTRACER
  End
OperTrace = Substr(Value('EZLTRACEO.'Opid()),1,2)


 Return_Code = 0

 /* If opid is valid then process, else route to BASEOPER autotask   */

 if opid() = Netoper2 | opid() = Netoper | opid() = Baseoper then
   Call PROCESS
 Else
  Do                                        /* route recovery */
    /* 'EZLEASCD AON Baseoper EZLEAGEN 'Parms                  */
 3     'AONCMD 'Baseoper' EZLEAGEN 'Parms
    Return_Code = 9
  End                                       /* route recovery */

 Call Leave_Now


PROCESS:
 Resname  = Parms
 4  'EZLEAGRN 'Resname
 'GLOBALV GETT RESTYPE RESSTAT '
 /* Issue EZL509I - resource UNAVAILABLE message   */
 5  'EZLEASLN NOTIFY=Y,STATUS=Y,'|| ,
      'AON,INACTV,EZLEAGEN,EZL509,'date("U")','|| ,
       substr(time(),1,5)','Resname','Restype','domain()
 Call ChkAuto
Return

/*-------------------------------------------------------------------*/
/*  PERFORM AUTOMATION                                               */
/*-------------------------------------------------------------------*/

CHKAUTO:
 /* Call the Check_Auto routine to check the RECOVERY Policy         */
 6  'EZLECAUT' Resname Restype
 if Rc ¬= 0 then                             /* don't auto resource? */
   Call EXIT0
7  'EZLEACKT' Resname                           /* Ck for exist timer  */
 if Rc = 1 then                              /* If timer exists?    */
   Call EXIT1
 if substr(Resstat,1,3) = 'ACT' then         /* if resource is ACT  */
   Call EXIT0
 if substr(Resstat,1,3) = 'CON' then         /* If resource is CONCT*/
   Call EXIT0

/* Call Thresholding routine to check the INFREQ/FREQ/CRIT Thresholds*/
8  'EZLEATHR' Resname','Restype',OPTION=SNA'
 if Rc = 0 then                              /* thresh ok?      */
   Call RECOVERY                             /* attempt recovery */
 else
   'VARY NET,ID='Resname',INACT,F'           /* inactivate it  */
Return

/*------------------------------------------------------------------*/
/*     ATTEMPT RECOVERY OF THE RESOURCE.                            */
/*------------------------------------------------------------------*/

RECOVERY:
9 "EZLECATV" Resname","Restype",0,"date('U')","substr(time(),1,5)
Call EXIT0

EXIT0:
  Return_Code = 0
  Call Leave_Now

EXIT1:
  Return_Code = 1
  Call Leave_Now
/*------------------------------------------------------------------*/
/* Exit Trace Call                                                  */
/*------------------------------------------------------------------*/
Leave_now:
 /* If Domain E/E trace is 'ON' or Oper E/E trace 'ON' ...     */
 If Substr(EZLTRACED,1,2) = 'ON' |,           /* If Domain on ..*/
    (Substr(EZLTRACED,1,3) = 'OFF' & OperTrace = 'ON') Then
   'EZLTRACE EXIT 'Ident Return_code         /* Call Exit Trace      */
 Exit Return_code
```

1 The common global variables and task global variables are defined.

2 EZLTRACE is called to perform AON standard entry tracing.

3 This section of code ensures the module is running under an automated operator, and if not, sends the command to the NETOPER or BASEOPER automation operator to run.

4 Common routine EZLEAGRN is called to get resource information.

5 An EZL509I message is logged regarding the availability of the resource.

6 The common routine EZLECAUT is called to verify that automation is enabled. The resource type and status is set from this module. If the recovery flag is on, the recovery module runs.

7 The existence of a timer for this resource is checked. If a timer exists with timer ID equal to the resource name, recovery is already in effect for this resource through another means. If recovery is already in effect, the program (command list) exits.

8 The resource is analyzed to determine whether a critical threshold has been exceeded. If it has, the resource is forced into the inactive state and the module exits.

9 EZLECATV is called to initiate recovery for the resource and continue recovery monitoring based on MONIT intervals.

Chapter 7. Using AON Command Processors

AON provides command processors to interface with the control file, status file, or automation log. These command processors update and retrieve data contained in the control file, status file, or automation log. AON provides the following command processors:

- “Control File Interface Command (EZLCFG)” on page 124
- “Log File Interface Command (EZLLOG)” on page 130
- “Status File Interface Command (EZLSTS)” on page 133
- “Using the SNBU Automation Status File Interface (FKVSNBU)” on page 137

Control File Interface Command (EZLCFG)

Purpose

Use the EZLCFG command to load, display, and modify the control file entries. You can also use the command to display the status of the control file function or to perform a syntax check on the control file member. Before you can display panels and modifications, you must load the control file into storage. After they are loaded, the panels and modifications affect an in-storage version of the control file, providing a temporary update facility. To permanently change the control file member, edit the DSIPARM data set, and reload.

Note: There are certain restrictions when you update the control file. Command updates to entries in the control file cannot be performed online if the control file entry is longer than 200 characters. This is a NetView restriction. To code an entry that is longer than 200 characters, change the configuration file and reload it.

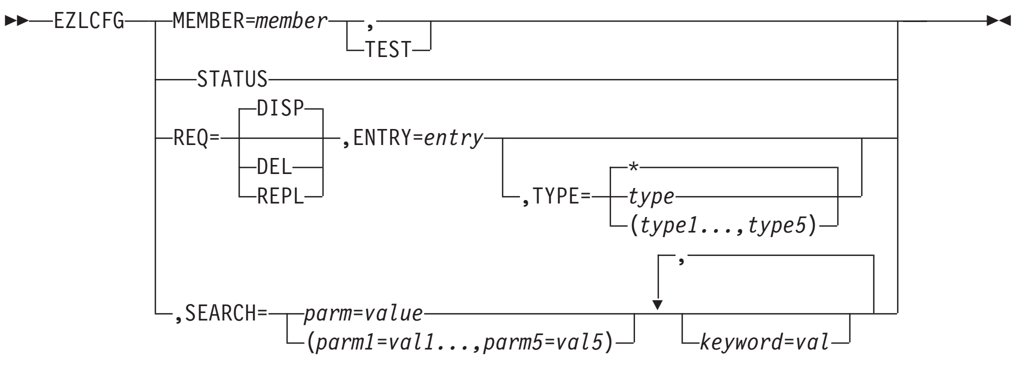
The control file entries are keyword oriented and, therefore, independent of the NetView command list language or the operating system. Modifications or displays using the EZLCFG command capitalize upon the use of these keywords to retrieve entries for individual resources, resource types (such as all NTFYOPS), or system wide defaults. This keyword structure decreases the need to generate command list variables that contain information for each resource.

The EZLCFG command functions both as an operator command and a command list interface to the control file.

Note: Use of the EZLCFG command is discouraged. Use the POLICY command. The EZLCFG command is still available for migration purposes. For additional information on the POLICY command refer to the *IBM Tivoli NetView for z/OS Automation Guide*.

Syntax

EZLCFG



Note: You can specify more than one *keyword=value* pairs.

Parameters

MEMBER
Specifies the member name containing the control file entries. This member is

loaded into storage for subsequent use. The member must exist in a data set that is concatenated with the data sets in the DSIPARM DD statement.

Using EZLCFG MEMBER=member might cause problems since all policy files to be loaded are defined in CNMSTYLE and its included members and are loaded using the POLICY command.

To load or test the control file, enter EZLCFG MEMBER=*member*[,TEST].

STATUS
Displays the name of the logical policy file loaded, or a message stating that the control file function is inactive.

ENTRY
Specifies the entry field of the control file. The entry-name must be 1 to 32 characters, without embedded blanks, commas, or quotation marks.

For display, delete, replace, or add requests:

TEST
Enables the user to perform very simple syntax checking of a control file member. Entries are not verified.

Note: MEMBER is the only operand allowed with TEST.

REQ
Specifies the type of request. DISP (display) is the default request if not entered. DEL (delete) and REPL (replace) must be entered when performing that function. REPL adds an entry if one does not exist.

TYPE
The type field on the control file. The default TYPE field is an asterisk (*) which is allowed only for DISP (display) commands. The specification of asterisk (*) returns all the type fields associated with a given entry name. For example, all resource entries or all NTFYOP entries.

You can specify up to five types of DISP, DEL, and REPL requests when performing the command. Only the first type found in the list of types is affected by the command.

When specified, *type* must be 1 to 32 characters, without embedded blanks, commas, or quotation marks.

SEARCH
Valid only when used with REQ=DISP. Searches all entries specified by ENTRY and TYPE for a match where *parms=value* defines the data to be associated with the specified ENTRY and TYPE fields. The *parm* can be any character data, without embedded blanks, commas, or quotation marks. The character (=) and the *value* must immediately follow the *parm*. The *value* can have embedded quotation marks, commas, and blanks as long as single quotation marks or parentheses are around the *value*. The parms=*value* field has a restriction of 70 characters.

When multiple search arguments are specified, an implied logical 'OR' operation is performed. Entries that match one of the search arguments are shown.

AON defines a number of ENTRY, TYPE and parms=*value* fields. The JOB=*jobname* parameter in the resource control file entry is an example of the parms=*value* field.

Usage

The following wildcard characters can be used:

*	Multiple character wild card
%	Single character wild card

For example, both PU0* and PU%% matches for PU01. SEARCH=(AUTO=*) matches for entries containing the AUTO parameter. ENTRY=ENVI* matches for all entries starting with ENVI.

When an EZLCFG REQ=DISP command is entered that requests a certain ENTRY with a one or more specific TYPEs, it searches for those types in the order they were specified in the command. When the first match is found, the information is returned to the requestor as a multiline message. If there are no matches, it performs a final search with a type-name of DEFAULTS for that ENTRY. If there is still not a match, a message is returned to the requestor. If the *type-name* of DEFAULTS is found, that information is returned to the requestor.

When performing a display, if a specific TYPE is found, it is treated as a COMPLETE entry. Only that specific entry is displayed.

To replace an existing entry, type the entire new entry. The REPLACE command is treated as a COMPLETE entry. The existing entry and the replacement entry do not merge. This replacement process has a limitation on the length of the REPLACE command. The maximum length command is 240 characters. When you attempt to replace a control file entry, the replacement entry can be no greater than 200 characters. To do a large replace command, use the INPUT 3 NetView command to expand your command buffer.

KEYWORD=*value* operands in the control file can be no longer than a single line.

Note: The control file member must be placed in storage using the PIPE INSTORE command. Prior to placing the item in storage, the SUBSYM stage must be invoked to resolve system symbolics. Failure to perform these actions prior to the EZLCFG call results in the stored version being used. Therefore, without invoking the SUBSYM stage, any changes to the control file on the DASD are ignored.

All policy definitions are loaded into NetView storage using PIPE INSTORE. If you make changes to your policy files in DSIPARM, you can use POLICY REQ=LOAD to reload you new policy definitions and remove the existing policy definitions.

Usage:

The POLICY command supports all functions that EZLCFG performs except the search function. Use the POLICY command whenever possible.

Messages

The following messages are issued during the successful operation of the EZLCFG command.

For the test function (TEST):

```
EZL026I TEST OF THE CONTROL FILE MEMBER "member-name" WAS UNSUCCESSFUL
```

For the status function (STATUS):

```
EZL005I MEMBER member-name CURRENTLY BEING USED FOR THE CONTROL FILE
```

For delete and replace commands:

```
EZL001I REQUEST "request" WAS SUCCESSFUL
```

For DISPLAY commands:

```
EZL111I AUTOMATION CONFIGURATION DISPLAY - ENTRY= entry-name
EZL112I ACTIVE TYPE= type-name  , DESIRED TYPE= type-name1 ...
EZL113I DATA IS parms=value
EZL002I END
```

Note: Multiple EZL113I messages might be displayed after an EZL112I command and where the *type-name* is an asterisk (*). When the type is omitted or specified as an asterisk (*), the DESIRED TYPE is not displayed on the EZL112I message. For example, the following can occur:

```
EZL111I AUTOMATION CONFIGURATION DISPLAY - ENTRY= NTFYOP
EZL112I ACTIVE TYPE= NETOP1
EZL113I    DATA IS OPER='OPER 1'
EZL113I    DATA IS CLASS=(10,40)
EZL112I ACTIVE TYPE= NETOP2
EZL113I    DATA IS CLASS=(10)
EZL002I END
```

The following messages are issued if the entry or member name was not found or the request failed.

For load function (MEMBER=):

```
EZL042I MEMBER member-name NOT FOUND
```

For the test function (TEST):

```
EZL027I THE FOLLOWING ERRORS ENCOUNTERED IN PROCESSING MEMBER member-name
EZL023A FIELD "KEYWORD='VALUE('" CONTAINS UNBALANCED PARENTHESIS
EZL029I ENTRYA TYPEA,KEYWORD='VALUE('
EZL028I member-name ERROR DISPLAY
EZL004I PROCESSING FAILED FOR "EZLCFG MEMBER=member-name" COMMAND
EZL026I TEST OF THE CONTROL FILE MEMBER "member-name" WAS UNSUCCESSFUL
```

For the status function (STATUS):

```
EZL040I CONTROL FILE INACTIVE
```

For the delete and DISPLAY commands:

```
EZL041I UNABLE TO FIND type name
```

Note: The REPLACE command adds an entry for a message if one does not exist.

Any messages beginning with EZL0 other than those previously documented must be considered an error situation.

Example

This example contains the command that displays the RECOVERY flag for PU01. The control file entry is:

```
RECOVERY PU01,AUTO=Y,NOAUTO=(TUESDAY,10:00,12:00)
```

The command is:

```
EZLCFG REQ=DISP,ENTRY=RECOVERY,TYPE=PU01
```

The response is:

```
EZL111I AUTOMATION CONFIGURATION DISPLAY - ENTRY= RECOVERY
EZL112I ACTIVE TYPE= PU01       , DESIRED TYPE= PU01
EZL113I    DATA IS AUTO=Y
EZL113I    DATA IS NOAUTO=(TUESDAY,10:00,12:00)
EZL002I END
```

In this example, a RECOVERY flag exists for the PU01 resource. The operator or command list processes the command to display the entry and the associated response is a multi-line message.

Example

This example shows a command to display the RECOVERY flag for PU0. The control file entries are:

```
RECOVERY DEFAULTS,AUTO=Y,NOAUTO=(MONDAY,10:00,12:00)
RECOVERY PU01,AUTO=Y,NOAUTO=(TUESDAY,10:00,12:00)
```

The command is:

```
EZLCFG REQ=DISP,ENTRY=RECOVERY,TYPE=PU01
```

The response is:

```
EZL111I AUTOMATION CONFIGURATION DISPLAY - ENTRY= RECOVERY
EZL112I ACTIVE TYPE= PU01       , DESIRED TYPE= PU01
EZL113I DATA IS AUTO=Y
EZL113I DATA IS NOAUTO=(TUESDAY,10:00,12:00)
EZL002I END
```

The previous example causes no change in the displayed data. Although a DEFAULTS flag exists, data from the different RECOVERY types (PU01 and DEFAULTS) do not merge.

Example

This example contains a command to display the RECOVERY flag for PU01. The control file entry is:

```
RECOVERY DEFAULTS,AUTO=Y,NOAUTO=(MONDAY,10:00,12:00)
```

The command is:

```
EZLCFG REQ=DISP,ENTRY=RECOVERY,TYPE=PU01
```

The response is:

```
EZL111I AUTOMATION CONFIGURATION DISPLAY - ENTRY= RECOVERY
EZL112I ACTIVE TYPE= DEFAULTS   , DESIRED TYPE= PU01
EZL113I    DATA IS AUTO=Y
EZL113I    DATA IS NOAUTO=(MONDAY,10:00,12:00)
EZL002I END
```

The pervious example shows the EZL112I message with the found *type-name* (ACTIVE) as DEFAULTS, but the requested *type-name* (DESIRED) is PU01. This occurs because there was no RECOVERYPU01 flag, therefore the EZLCFG command automatically searches for a *type-name* of DEFAULTS. For this example, a RECOVERY DEFAULTS entry existed; therefore that information was displayed.

Assuming a DEFAULTS entry did not exist, the command would have resulted in an EZL041I UNABLE TO FIND TYPES... message.

Example

This example contains a command to display the RECOVERY flag for PU01 or PU, depending on which one exists. The control file entry is:

```
RECOVERY PU,AUTO=Y
```

The command is:

```
EZLCFG REQ=DISP,ENTRY=RECOVERY,TYPE=(PU01,PU)
```

The response is:

```
EZL111I AUTOMATION CONFIGURATION DISPLAY - ENTRY= RECOVERY
EZL112I ACTIVE TYPE= PU  , DESIRED TYPE= PU01
EZL113I    DATA IS AUTO=Y
EZL002I END
```

The EZL112I message shows that the *type-name* found (ACTIVE) is PU, the requested types (DESIRED) were PU01 and PU. The EZLCFG command searched first for the RECOVERY PU01 flag; when none was found, the command searched for the RECOVERY PU flag.

Log File Interface Command (EZLLOG)

The EZLLOG function is used to update and view the automation log. The syntax of the EZLLOG function is:

Syntax

EZLLOG

```
►►──EZLLOG──ID=resource──,FUNC=function──,STATUS=status──,OPID=operator-id──────►

►─,DOMAIN=domain-id──,FROM=──┬─clist──┬──,DESC=message_text──────────────────────►◄
                             └─operid─┘
```

Parameters

ID Resource associated with this log record

FUNC
Feature that wrote this record. The function entries in the automation log indicate which function in network automation wrote the record.

This field can be any 4 characters.

STATUS
Automation status of the resource. For a list of the status codes, see "Status File Interface Command (EZLSTS)" on page 133.

OPID
Requesting operator ID.

DOMAIN
Originating domain ID

FROM
Name of the command list or operator that generated the record to the log.

DESC
Description text to be written in log record. The format is

```
DESC=msgno text
```

Where the variables are:

msgno
Number of the message that generated the log entry.

text
Free-form text describing the log event.

The maximum length is 240 bytes.

Usage

The log records are:
- Availability records
- Information records
- Errors and debug records

Use availability records to create an availability trend report. AON writes records to the log when a resource becomes unavailable or when the resource becomes available again.

Information records describe the activities of the automation process. These are the AON tracking records.

Errors and debug records are written when an error has occurred (for example, wait time-out) or when the debugging feature is in effect.

The EZLLOG and EZLALOG commands, and the EZLTLOG task are:

EZLLOG
: This command can be issued from the operator's terminal, program, or another command processor. EZLLOG performs syntax checking necessary before sending the request to the automation log task (EZLTLOG). Such errors as, valid length and required parameters are checked. If it detects errors, it returns a message explaining the error to the originator of the request.

EZLALOG
: This command is run as a data services command. The EZLALOG command writes the record to the automation log file and returns messages to the requestor indicating the success or failure of the request.

EZLTLOG
: This task handles the necessary interfaces to perform the NetView facilities. When EZLTLOG receives the internal function request (IFR) from EZLLOG, it issues the appropriate command, in this case EZLALOG.

To start the automation log task, the following command must be entered on the operator command line of a NetView screen or from the NetView initial startup program using STARTEZL:

```
STARTEZL LOG
```

The following messages display when the task has been initiated:

DSI166I EZLTLOG IS ACTIVATED BY *operator_ID*
DSI530I EZLTLOG : DST IS READY AND WAITING FOR WORK

Example

The command list writes a record to the automation log indicating that a resource has recovered. This example is for illustrative purposes and might not reflect current AON code:

```
'GLOBALV GETC DOMAINID'
ReqDomid = Domainid

Ezlstatus  = 'ACTIV'

Ezlmsgtxt = ezlemsg('EZL504','N',Clsnm,Resname,Restype)

if Nlogname = '' then
  Nlogname = SUBSTR(Resname,1,8)

if Nlogfunc = '' then
  if LENGTH(Ezltower) <= 4 then
    Nlogfunc = Ezltower
  else
    Nlogfunc = SUBSTR(Ezltower,1,4)

if pos('/',clsnm) > 0 then
```

```
    parse var clsnm clsnm '/' .

if length(clsnm) > 8 then
    clsnm = substr(clsnm,1,8)

'TRAP AND SUPPRESS MESSAGES ONLY EZL006I EZL009I EZL01* EZL020I '||,
  'EZL030I DSI002I CNM421I'
Logcmd = 'EZLLOG '||,
  'ID='Nlogname',FUNC='Nlogfunc',OPID='Reqopid',DOMAIN='||,
  Reqdomid',FROM='Clsnm',STATUS='Ezlstatus',DESC='Ezlmsgtxt

Logcmd = LEFT(Logcmd,240)
Logcmd
```

The previous command results in the following entry in the automation log:

```
EZL504I HOST AVOSTIN IS AVAILABLE (REPORTED BY NTC0PUN6)
```

If you page to the left in the automation log, you see the following:

```
13:44:31 EZLERECV AUTMSG2  NV6K  NORMAL   AVOSTIN  CNM01
```

Status File Interface Command (EZLSTS)

Purpose

Use the EZLSTS command to add, display, change, and delete the status file records. The records are maintained in a VSAM data set. The EZLSTS command interfaces with the VSAM file to maintain control information vital to AON. The critical information maintained is:
- Automation status
- Whether an error threshold has been exceeded
- Time and date information for error conditions. All entries use GMT timestamps.

The EZLSTS command functions as an operator command and as a command list interface to the status file.

Note: Restrict the use of EZLSTS as an operator command, because this command can modify any field on the status file, and incorrect use can lead to unpredictable results.

Every field defined in the status file is updated by certain automation routines. User-written command lists must use common routines to perform the updates, to ensure proper updating of all the fields. Use the EZLSTS command only to display information.

Syntax

Use the following syntax for adding, updating, displaying, or deleting a single entry:

EZLSTS

```
►►──EZLSTS──ID=resource──┬────────────────────┬──┬─────────────────┬──────────►
                         │        ┌─DISP─┐     │  └─,TYPE=resource─┘
                         └─,REQ=──┤      ├─────┘
                                  ├─DEL──┤
                                  └─REPL─┘

►──┬────────────────────┬──┬────────────────┬──┬────────────────┬─────────────►
   └─,OPID=operator_id──┘  └─,STATUS=status─┘  └─,NOTIFY=──┬─Y─┬┘
                                                           └─N─┘

►──┬──────────────────────────┬──┬──────────────────┬──┬──────────────────┬───►
   └─,MONITOR=monitored-time──┘  └─,DATE=error-date─┘  └─,TIME=error-time─┘

►──┬─────────────────────┬────────────────────────────────────────────────►◄
   └─,THRSHLD=──┬─CRIT─┬─┘
                ├─FREQ─┤
                └─INFR─┘
```

Use the following for displaying multiple records:

```
►►──EZLSTS──FROM=resource──┬──────────────┬──┬───────────┬────────────────►◄
                           └─,TO=resource─┘  └─,REQ=DISP─┘
```

Parameters

ID=*resource*
Specifies the 16-character resource ID that is the key to the status file record. This ID is the resource name for resource records.

FROM=*resource*
Specifies the 16-character resource ID that is the starting key when displaying multiple status file records. This resource is the resource name for resource records.

TO=*resource*
Specifies the 16-character resource ID that is the ending key when displaying multiple status file records. If not specified, the value defaults to the same key as the FROM parameter. This resource is the resource name for resource records.

REQ={DISP|DEL|REPL}
Specifies the type of request. DISP (display) is the default request if not entered. DEL (delete) and REPL (replace) must be entered when performing that function. REPL adds a record if one does not already exist.

OPID=*operator_id*
The NetView operator ID which requested or is performing the status update. If not supplied, the EZLSTS command uses the current operator ID. This is only applicable when the STATUS parameter is used.

TYPE=*resource*
Specifies the 10-character resource type for display and summary purposes. This value is the resource type for the specific resource. For example, physical units are represented by PU and NCPs are represented by NCP. Other values can be defined, if desired.

STATUS=*status*
Specifies the resource status. The parameter can be any valid status value. The following is a list of valid status codes generated by AON automation:

INACTV	Resource is inactive.
ACTIVE	Resource is active.
INRCVY	Resource is in recovery.
RCVAUT	Resource recovered by AON automation.
RCVSYS	Resource recovered by the system.
TUSER	Resource recovery ended by user.
TTHRS	Resource recovery ended by automation thresholds.
REACTV	Reactivation process enabled.
TREACT	Recovery halted; reactivation intervals exceeded.
MANUAL	Manual intervention is required.
NCPDMP	NCP dump has a reply to (AON/SNA only).
NCPRLD	NCP reload has a reply to (AON/SNA only).
ERRORS	Command list error conditions.
TRACKS	Command list tracking records.
REMIND	Reminder processing enabled.
REMTRM	Reminders halted; reminder intervals exceeded.
IUSER	Resource deactivated by user.
RECVRY	Resource currently being recovered by automation.

NOTIFY={Y|N}
Specifies whether a notification message was sent to the operator for a specified condition.

MONITOR=*monitored-time*
Specifies the time a monitor or status change command was issued in HH:MM format. Time is in military time (00:00 to 23:59).

DATE=*error-date*
Specifies the date of this error time stamp being recorded, in MM/DD/YY format. Date is used for threshold purposes.

TIME=*error-time*
Specifies the time of this error time stamp being recorded, in HH:MM format. Time is used for threshold purposes.

THRSHLD={CRIT|INFR|FREQ}
Specifies the threshold which has been exceeded. Used for operator monitoring of thresholds.

Usage

If a user-written command list performs a replace and update function, only those fields that need replacing have to be specified. No change occurs to the other fields on the status file. The EZLSTS command has a maximum length of 240 characters, so a REPLACE/UPDATE command is limited to the 240 characters.

Messages

The following messages are issued during the successful operation of the EZLSTS command. For the DELETE and REPLACE commands, a message such as the following is issued:

```
EZL001I REQUEST "request" WAS SUCCESSFUL FOR "resource"
```

For the DISPLAY commands, the following messages are issued for PU01:

```
EZL150I STATISTICS DISPLAY REQUESTED FOR PU01
EZL151I ID= PU01  , TYPE= PU        , STATUS= ACTIV
EZL152I LAST UPDATE BY OPERATOR AUTNET2
EZL153I LAST THRESHOLD EXCEEDED - INFR
EZL155I OPERATOR NOTIFIED: Y , TIMERSET:
EZL156I LAST STATUS CHANGE DATE= 01/06/00 , TIME= 13:41, OPID= AUTNET2
EZL157I LAST MONITORED DATE= 01/06/00 , TIME= 13:41
EZL160I   ERROR COUNT     DATE      TIME
EZL161I          01    01/06/00    13:35
EZL161I          02    01/06/00    13:40
EZL002I END
```

Note: For DISPLAY commands, EZL160I and EZL161I messages that contain error time stamp information can be replaced with EZL159I if error timestamp information does not exist.

Messages are issued if the entry or member name is not found. For the DELETE and DISPLAY commands, a message such as the following is issued:

```
EZL041I UNABLE TO FIND RECORD "resource"
```

Note: The REPLACE command adds an entry if one does not exist, so successful message would result.

Any message beginning with EZL0, other than those previously documented, is an error.

Example

A command that displays the status record for PU01 follows:

```
EZLSTS REQ=DISP,ID=PU01
```

The response follows:

```
EZL150I STATISTICS DISPLAY REQUESTED FOR PU01
EZL151I ID= PU01     , TYPE= PU         , STATUS= ACTIV
EZL152I LAST UPDATE BY OPERATOR AUTMSG
EZL153I LAST THRESHOLD EXCEEDED - INFR
EZL155I OPERATOR NOTIFIED: Y , TIMERSET:
EZL156I LAST STATUS CHANGE DATE= 05/06/00 , TIME= 09:17, OPID= AUTNET2
EZL157I LAST MONITORED DATE= 05/06/00 , TIME= 09:17
EZL160I   ERROR COUNT     DATE      TIME
EZL161I          01    05/06/00    14:21
EZL002I END
```

The operator or command list processes the command to display the entry, and the associated response is a multiline message.

Example

The following command adds or replaces the PU01 status value:

```
EZLSTS REQ=REPL,ID=PU01,STATUS=INACT
```

The response follows:

```
EZL001I REQUEST "REPL" WAS SUCCESSFUL FOR "PU01   "
```

Using the SNBU Automation Status File Interface (FKVSNBU)

Purpose

The FKVSNBU command is a command processor that provides an interface to the SNBU automation status file. With the FKVSNBU command, you can add, display, change, or delete AON/SNA SNBU automation status file records from the AON status file.

The EZLSTS file tracks the status of the lines that are in switched speed or in backup. AON/SNA SNBU automation maintains these status file entries.

Syntax

Use the following syntax for single records:

FKVSNBU

```
                              ┌DISP┐
►►─FKVSNBU─ID=SUpu_name─,REQ=─┼DEL─┼─,STATUS=status─,HIER1=ncp──────────►
                              └REPL┘

►─,HIER2=line─,HIER3=pu_name─┬─────────────────┬─┬────────────┬─────────►
                             └,ALTPORT=alt_port┘ └,POOL=pool──┘

                                  ┌1┐
►─,SPEED=─┬FULL──┬─,LEVEL=─┴2┴──────────────────────────────────────────►◄
          └BACKUP┘
```

Use the following syntax for multiple records:

FKVSNBU

```
►►─FKVSNBU─FROM=res_name─┬───────────────┬─┬──────────┬────────────────►◄
                         └,TO=res_name───┘ └,REQ=DISP─┘
```

Parameters

ID Identifies the status file record. If the record is for an alternate port, the first 2 characters are SU followed by the PU name or the NCP line name. This naming convention prevents AON/SNA entries from changing the AON/SNA SNBU entries when PU errors occur.

REQ
Specifies the type of request. You can use the following types:

DISP Displays the default. If you use DISP, code the ID parameter only.

DEL Deletes a status file record. If you use DEL, code the ID parameter only.

REPL Replaces a status file record. If a record did not already exist, REPL adds a new one.

STATUS
Identifies the AON/SNA SNBU automation status. The status codes are:

INIT Identifies initial status for speed selection (operation begun).

ISNBU
Initiates AON/SNA SNBU (operation begun).

BOTH Transmits and receives lines in backup speed.

LOCAL
Transmits side of line in backup speed.

RCV Receives side of line in backup speed.

SNBU Indicates successful dial connection (operation completed).

BUSY Indicates alternate port is in use.

DOWN
Indicates alternate port is inoperative.

HIER1
Identifies the first resource name in the hardware monitor alert hierarchy. For AON/SNA SNBU automation, it is the name of the NCP.

HIER2
Identifies the second resource name in the hardware monitor alert hierarchy. For AON/SNA SNBU automation, it is the name of the line.

HIER3
Identifies the third resource name in the hardware monitor alert hierarchy. For AON/SNA SNBU automation, it is the name of the PU.

ALTPORT
Names the alternate port in use, if specified in the control file entry for the PU.

POOL
Identifies the modem pool from which the current modem was chosen.

LEVEL
Specifies the modem link segment level when in a tailed-circuit modem configuration. The default is 1.

SPEED
Indicates whether the modem is operating at full speed or whether it has been switched to backup speed by AON/SNA SNBU automation.

FROM
Used with the FKVSNBU command, displays the AON/SNA SNBU status file records beginning with those for this resource.

TO
Used with the FKVSNBU command, displays the AON/SNA SNBU status file records up to those for this resource.

Usage

To display multiple status records, use the FROM and TO parameters. REQ=DISP is the default. No other parameters are necessary.

Example

The following is a sample EZLSTS record:

```
EZL150I STATISTICS DISPLAY REQUESTED FOR SUpuname
EZL151I ID= SUpuname  , TYPE= SNBU     , STATUS= SNBU
EZL152I LAST UPDATE BY OPERATOR operid  , RECORD TYPE=
EZL153I LAST THRESHOLD EXCEEDED -
EZL155I OPERATOR NOTIFIED: N
EZL156I LAST STATUS CHANGE DATE= 11/07/00 , TIME= 08:20 , OPER= operid
```

```
EZL157I LAST MONITORED DATE= 11/07/00 , TIME= 08:20
EZL162I HIER  1= ncpname  , 2= linename , 3= puname   , 4=     , 5=
EZL163I ALTPORT= ********** , POOL= **** , SPEED= **********, LEVEL= *
EZL002I END
```

Chapter 8. Coding Common Routines

Common routines provide easy-to-use generic functions for expanding automation capabilities beyond those provided and supported by AON. These generic functions can be used to reduce development time when creating procedures or extending those provided.

Transferring information and checking the control file are examples of tasks where common routines are applicable. A user-written routine calls one of these routines from the message table, control file, or extended routine to perform a specific task.

AON also provides user exits that can be called by the common routines. User exits perform functions such as syntax or threshold checking.

Table 7 lists the common routines described in this section.

Table 7. AON Common Routines

Name	Usage
CGLOBAL	“Using the Common Global Variable Command Processor (CGLOBAL)” on page 143
EXIST	“Querying Command Availability (EXIST)” on page 144
EZLEATDF	“Calculating Time (EZLEATDF)” on page 145
EZLE1UFW	“Forwarding User Messages (EZLE1UFW)” on page 146
EZLEACKT	“Checking the Timer (EZLEACKT)” on page 147
EZLEAGEN	“Recovering Generic Resources (EZLEAGEN)” on page 148
EZLEAGRN	“Getting Resource Information (EZLEAGRN)” on page 149
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EZLECATV	“Using Active Monitoring and Recovery (EZLECATV)” on page 160
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EZLERTVE	“Retrieving AON Information (EZLERTVE)” on page 182
EZLESRMD	“Issuing Resource State Reminders (EZLESRMD)” on page 184
EZLESTOP	“Stopping Cross-domain Sessions (EZLESTOP)” on page 185

Table 7. AON Common Routines (continued)

Name	Usage
EZLESTRT	“Starting Cross-domain Sessions (EZLESTRT)” on page 186
EZLEVACT	“Activating VTAM Resources (EZLEVACT)” on page 188
EZLEVINA	“Deactivating VTAM Resources (EZLEVINA)” on page 189
EZLEVMOV	“Moving VTAM Resources (EZLEVMOV)” on page 190
EZLSMSU	“Sending MSUs to an MS Transport Application (EZLSMSU)” on page 191
EZLTRACE	“Running Entry and Exit Traces (EZLTRACE)” on page 193
FKVESYNC	“SNA Resource Automation (FKVESYNC)” on page 202
FKXECNVT	“SNMP RFC Conversion (FKXECNVT)” on page 195
FKXETRA1	“Syntax of FKXETRA1 Program” on page 199
IPCMD	“TCP/IP Command Support (IPCMD)” on page 197

Using the Common Global Variable Command Processor (CGLOBAL)

Purpose

The CGLOBAL routine displays the names and value associated with common global variables. Running the CGLOBAL routine displays the message EZL016I containing the name of the common global variable and the message EZL017I containing the value associated with the common global variable.

Syntax

CGLOBAL

```
►►──CGLOBAL──varname──────────────────────────────────────────────────►◄
```

Parameters

varname
: The specific name of a global variable or a name pattern with wildcard characters (* or %)

Example

Issuing **CGLOBAL domainid** returns the following messages:

```
 EZL016I NAME  = DOMAINID
 EZL017I VALUE = CNM01
 EZL002I END
```

The message EZL017I shows that `CNM01` is the value associated with the common global variable `domainid`.

Example

Issuing **CGLOBAL *time** returns the following messages:

```
EZL001I C *T
EZL016I NAME  = CNMSTYLE.NPDA.ALT_ALERT
EZL017I VALUE = DOMAIN
EZL016I NAME  = CNMIP.DNSTIMEOUT
EZL017I VALUE = 5
EZL016I NAME  = FKXIPSTAT
EZL017I VALUE = DETAIL
EZL016I NAME  = CNMSTYLE.NLDM.LUCOUNT
EZL017I VALUE = 4000
EZL016I NAME  = CNMSTYLE.NRM.STATUS.INACT
EZL017I VALUE = UNKNOWN
EZL016I NAME  = CNMSTYLE.REXEC.PORT
EZL017I VALUE = 512
EZL016I NAME  = CNMSTYLE.RSH.PORT
EZL017I VALUE = 514
⋮
EZL002I END
```

The EZL016I messages show all of the command global variables that end with the characters `time`. The EZL017I messages show the values associated with each command global variable.

Querying Command Availability (EXIST)

Purpose

EXIST determines whether the specified command is available and sets a return code as its response. Only libraries in the DSICLD or STEPLIB concatenation are searched. The command must be a valid command list, REXX program, or NetView command processor.

Syntax

EXIST

```
▶▶──EXIST──command──────────────────────────────────────────────────────▶◀
```

Parameters

command
Name of a command

Return codes

0	Valid command
4	Operator is not authorized to issue the command
8	Error (incorrect command name or no command specified)
16	Not found

Example

The following REXX fragment is an example of how you can use EXIST:

```
/* Check to see if BLOG command is installed, and call if found */
'EXIST BLOG'
 ExistRC = RC
 if ExistRC = 0 then
    do
       'BLOG'
    end
```

Calculating Time (EZLEATDF)

Purpose

The EZLEATDF routine calculates the difference between two date and time stamps and returns the values in TGLOBALs in terms of days, hours, minutes, and time. Keep the parameters for the EZLEATDF routine in the same order as they are shown in the following syntax diagram.

Syntax

EZLEATDF

```
►►──EZLEATDF── start_date── start_time── end_date── end_time──────────────────►◄
```

Parameters

start_date	Earliest date (in *mm/dd/yy* format)
start_time	Earliest time (in *hh:mm* format)
end_date	Later date (in *mm/dd/yy* format)
end_time	Later time (in *hh:mm* format)

Return codes

0	Program processed successfully.
5	Parameters are not valid.

Task global variables

TIMEDIFF	The number of hours and minutes between start and end (after the difference in days is calculated)
DAYSDIFF	The number of days between start date and end date
HOURDIFF	Total hours and minutes between start date and end date (in *hh:mm* format)
MINDIFF	Total minutes between start time and end time *((hh*60) + mm)*. To express the total difference in minutes, add the HOURDIFF global (converted to minutes) to the MINDIFF value.

Example

This program call:

```
EZLEATDF 06/23/00 06:28 06/24/00 15:50
```

Sets the following task global variables:

```
TIMEDIFF = 09:22
DAYSDIFF = 2
HOURDIFF = 57:22
MINDIFF  = 3442
```

Forwarding User Messages (EZLE1UFW)

Purpose

The EZLE1UFW routine forwards messages to an AON focal-point domain.

Syntax

EZLE1UFW

```
►►──EZLE1UFW──CLASS=─┬─class─────────────┬─┬───────────────┬──────────────────►◄
                     │   ┌─,──────┐      │ └─MSG='text'──┘
                     │   ▼        │      │
                     └─(───class──┴─)────┘
```

Parameters

CLASS=*class*
: Specifies message classes used to determine which notification operators receive this message. You can specify up to ten message classes. There are no default message classes. The AON notification classes are in the range 00—99. The different notification classes are described in *IBM Tivoli NetView for z/OS Messages and Codes Volume 2 (DUI-IHS)*.

  Note: The classes must be the same as those defined with the NTFYOP control file entry, as described in Chapter 7, "Using AON Command Processors," on page 123.

MSG='*text***'**
: Specifies the text used for this message. If not coded, the text in the message buffer is used. Although this variable is usually optional, it is required if not called from the automation table.

Return codes

0	Program (command list) processed correctly.
1	Processing error was encountered.

Usage

The MSG parameter cannot be used for multiline messages.

Example

The following example sends individual messages for each line in the multiline response:

```
IF MSGID='IST075I'
THEN EXEC(CMD('EZLE1UFW CLASS=20')ROUTE(ALL*));
```

Checking the Timer (EZLEACKT)

Purpose

The EZLEACKT routine determines whether a timer exists and stores pertinent timer data in task global variables (TGLOBALs).

Syntax

EZLEACKT

```
►►──EZLEACKT──timerid──────────────────────────────────────────────────►◄
```

Parameters

timerid
Specifies the ID of the timer being searched for. Typically, for AON recovery efforts, this is the resource name.

Return codes

0	Timer does not exist.
1	Timer exists.

Task global variables

EZLTIMCM	Command to be issued under timer ID
EZLTIMOP	Operator under which the timer would run
EZLTIMTM	Time of day the timer would pop
EZLTIMDT	Date the timer would pop

Usage

The EZLEACKT routine is used primarily to determine if automation is already in effect for a resource with an existing timer ID, such as timers from MONIT intervals.

Recovering Generic Resources (EZLEAGEN)

Purpose

EZLEAGEN is a generic module that can do the following:

- Attempt resource recovery
- Check error thresholds
- Check automation recovery flag
- Check resource status
- Initiate recovery on MONIT intervals

Syntax

EZLEAGEN

```
►►──EZLEAGEN──resource──────────────────────────────────────────────►◄
```

Parameters

resource
The resource to be recovered

Usage

This routine is provided as a model for user-written modules extending AON techniques. The EZLEAGEN module can be started by sending it a valid VTAM resource name.

Example

See "Sample AON Extended Module" on page 119 to see how EZLEAGEN is coded.

Getting Resource Information (EZLEAGRN)

Purpose

The EZLEAGRN routine retrieves VTAM information on a resource through a VTAM display command and stores the data in task global variables (TGLOBALs).

Syntax

EZLEAGRN

```
►►──EZLEAGRN──res_name──────────────────────────────────────────────►◄
```

Parameters

res_name
The name of the VTAM resource to be displayed

Return codes

0	Resource values assigned
1	Module error

Task global variables

Table 8 lists the EZLEAGRN routine TGLOBALs.

Table 8. TGLOBALs for EZLEAGRN

TGLOBAL	Description	Retrieved from VTAM message
RESTYPE	Resource type	IST075I
RESSTAT	Resource status	IST486I
RESMAJ	Resource’s major node	IST134I or IST081I
RESLINE	Resource’s higher node-line	IST081I
RESNODE	Resource’s adjacent major node	IST391I
RESPU	Resource’s higher node controller	IST135I
RESSA	Resource’s subarea	IST484I
RESSW	Resource’s switched major node	IST136I
RESNET	Resource’s network ID	IST075I or IST1043I

Usage

VTAM resource types are translated into the following standard automation resource categories:

LU	Logical unit
PU	Physical unit
PU	LCL*
LINE	Line
PU	PU*
NCP	PU T4/5

NCP	CA Major Node
CDRM	CDRMs
LINK	Link Station
CP	Control Point

All other resource types remain the same. If the resource cannot be displayed in VTAM, a resource type of DEFAULTS is issued and message EZL208I is logged.

The EZLEAGRN routine gathers information about SNA resources. However, your installation might require you to tailor the information gathered by the EZLEAGRN routine. You can code user exits to alter this information. You can update values for the EZLEAGRN routine with the EXIT05 parameter of the ENVIRON EXIT control file entry. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information about the ENVIRON EXIT entry.

Updating the Status File and Logging Messages (EZLEASLN)

Purpose

The EZLEASLN routine updates the AON status file, logs associated messages in the AON log file and NetView log, and issues notifications. The content of the log or notification message depends on the message ID and the variable data that is placed in the message.

This routine can only be initiated by another module or by a command processor. Keep the parameters for the EZLEASLN routine in the same order that they are shown in the following syntax diagram. Even though you do not use some of the parameters, include the comma delimiters as if those parameters were in the routine.

Syntax

EZLEASLN

```
►►──EZLEASLN──┬──────────────────────────┬──┬────────────────┬──,function──────────►
              └─NOTIFY=──┬─Y──────────┬──┘  └─,STATUS=──┬─Y─┬─┘
                         ├─N──────────┤                 └─N─┘
                         └─Event_Type─┘

►─,status──,modulename──,msgno──,date──,time──,──┬─trig─┬──,──┬─msg_type─┬─────────►
                                                 └─res──┘     └─res_type─┘

    ┌─.,──────┐
    ▼         │
►───┬──────┬──┴───────────────────────────────────────────────────────────────────►◄
    └─parm─┘
```

Parameters

NOTIFY
Specifying Y enables notifications to an operator and message forwarding of some event. Specifying Y queries the NOTIFY Policy based on ResName and ResType.

Specifying N does not notify anyone, it only logs the message to DSILOG.

Specifying Event_Type queries the NOTIFY Policy for the type of event such as:

- CRITTHRS
- REMIND
- NOMOMONS
- NAMESERV

STATUS
Specifying Y enables updates to the status file with the following data:
- RESSTAT
- RESTYPE
- OPID

function
Defines the AON component that wrote the message. The function can be:
- AON
- APPN
- IP390
- NVAIX
- SA
- SNA
- SNBU
- TCPIP
- X25

status
Specifies the resource status. This value updates the information in the status file and logs it in the AON log. The following is a list of some of the valid status codes generated by automation:

ACTIVE	Resource is active.
ERRORS	Command list error conditions.
INACTV	Resource is inactive.
INRCVY	Resource is in recovery.
IUSER	Resource deactivated by user.
MANUAL	Manual intervention is required.
NCPDMP	NCP dump has been replied to (AON/SNA only).
NCPRLD	NCP reload has been replied to (AON/SNA only).
RCVAUT	Resource recovered by AON automation.
RCVSYS	Resource recovered by the system.
REACTV	Reactivation process enabled.
RECVRY	Resource currently being recovered by automation.
REMIND	Reminder processing enabled.
REMTRM	Reminders halted; reminder intervals exceeded.
TRACKS	Command list tracking records.
TREACT	Recovery halted; reactivation intervals exceeded.
TTHRS	Resource recovery ended by automation thresholds.
TUSER	Resource recovery ended by user.

modulename
Specifies the name of the module or program that is issuing the message. This parameter is used in the AON log, by the tracking and problem determination processes.

msgno
Specifies the number of the message to be issued.

date
The date the message was logged. Use the NetView variable, *&DATE* or REXX function date ('U').

time
The time the message was logged. Use the NetView variable, *&TIME* or REXX function *TIME('U')*.

{*trig*|*res*}
Specifies the ID of the resource or the specific cause for the message being issued. For errors and tracking information, the message trigger typically is the command that caused the error message to be issued. The message trigger can also be the operator ID, a parameter keyword, a control file keyword, or other similar indicative information.

The *trig* variable can be a maximum of 8 characters in length and cannot contain spaces.

msg_type|*res_type*
Specifies the resource type or the general cause for the message being issued. For errors and tracking information, the message type is typically ERR or ERROR. The message type can also be INFO, INIT, or similar indicative values.

The *msg_type* variable can be a maximum of 10 characters in length.

parms
User parameters are message-dependent fields that fill in the message content. Up to 5 user parameters can be coded, but a restriction of 240 characters in the EZLEASLN call can reduce the actual number of parameters that can be coded.

Return codes

0	Message request processed successfully.
4	An error has occurred. Browse the log for further details.
9	Message request has been routed to a MSGOPER autotask.

Usage

The EZLEASLN routine can perform the following functions:
- Message logging
- Status update and message logging
- AON notification processing based on the NOTIFY policy

Use the EZLEASLN routine when logging messages. Messages produced by calling this routine are not displayed at operator stations if NOTIFY=N is specified.

It can also be used to display a message to the operator. Messages produced by calling this routine are displayed at a NetView terminal, if an authorized notify operator is logged on, or at the z/OS system console if the notify operators are not logged on. These messages are forwarded to the focal point before being displayed.

Use the EZLEASLN routine when you change the resource status, and notification of that change is to be displayed to the operator. The current status in the AON status file is changed by this routine.

The field values passed to EZLEASLN are evaluated against the DDFGENERIC control file entry definitions that guide DDF updates. The following fields, sent to EZLEASLN, are evaluated for DDF generic values:

EZLEASLN parameter	DDF generic field
function	*func*
status	*status*
resource	*res_name*
res_type	*res_type*

parms1...parms5	*opt1...opt5*

The function value sent is used for the function value for evaluating DDFGENERIC statements.

The parameters passed to the EZLEASLN routine are dependent on the format of the message. Some messages have more parameters than others. AON messages are shipped in object code format for improved performance. To determine the number of inserts in a message, view the online help for the message. The message inserts are passed as `user parms` on the call to EZLEASLN.

Example

This example shows how to issue a simple status update message. The INACTIVE message has been received for LINE01. The message to be issued, EZL531I, indicates the new status value.

The message text for EZL531I follows:

```
EZL531I &4 &3 IS INACTIVE DUE TO OPERATOR &5 INTERVENTION
```

The module to call EZLEASLN is:

```
USERSLN  module
     &CGLOBAL ABC XYZ ... ...
     &TGLOBAL
*
*    Perform check automation
*
     EZLECAUT LINE01
⋮
     &IF &RETCODE EQ 0 &THEN &GOTO -AUTOOK
     &EXIT
-AUTOOK
     EZLEASLN NOTIFY=Y,STATUS=Y,AON,INACTV,USERSLN,EZL531,&DATE,
              &TIME,LINE01,LINE,OPER1

⋮
     &EXIT
```

The user-written module calls EZLECAUT to determine if automation is valid. If the return code greater than zero (0), automation is not permitted. If it is 0, the routine continues.

After it is determined that NetView automation is in effect, EZLEASLN is called. The *function* parameter is AON, indicating automation activity triggered the message. *Status* is INACTV, denoting the new status for LINE01. This status value is placed in the AON status file. The *modulename* is USERSLN.

The message number EZL531 is suffixed by an I to build a message identifier of EZL531I. EZL531I is inserted at beginning of the message text.

The date and time are coded as &DATE and &TIME.

The resource is coded as LINE01 (VTAM resource name). The resource type is coded as LINE (VTAM resource type), which is &4.

The first user parameter is OPER1. It replaces &5 in the message text.

Checking Thresholds (EZLEATHR)

Purpose

The EZLEATHR routine checks the number of errors recorded in the status file against a preset error threshold. It also supports the recording of the error date and time on the status file.

The EZLEATHR routine searches the automation control file for the applicable threshold of a specific resource. The routine then obtains the error status information from the status file and determines whether any of the three definable thresholds have been exceeded. If a threshold is exceeded, AON issues an error message and an appropriate return code is generated.

This routine can be issued only by another module or by a command processor.

Keep the parameters for the EZLEATHR routine in the same order as they are shown in the following syntax diagram. Use commas or spaces as delimiters.

Syntax

EZLEATHR

```
                                           ┌─NEW───┐
►►──EZLEATHR──resource──res_type──┬─────────┬──┼───────┼──OPTION=opt──────────►◄
                                  └─serv_pt─┘  └─CHECK─┘
```

Parameters

resource
Specifies the name of the resource for which thresholds are be checked. This resource name can be a generic resource type or any user-defined name up to 8 characters long. The resource name is required and must be the first parameter.

res_type
Specifies the type of the resource. The *res_type* parameter can be any user-defined name up to 10 characters long. The resource type is required and must be the second parameter.

serv_pt
Specifies the name of the TCP/IP service point controlling the specified resource. If specified, *serv_pt* must be the third parameter. If not specified, the default is the NetView DomainID.

NEW | CHECK
Specifies whether a new error is added to the error status information. If you specify NEW or use the default, an error is added to the error status information, then the thresholds are checked. If you specify CHECK, the thresholds are checked based on the existing error information and no new information is added. If you specify NEW or CHECK, place the parameter in the fourth position.

opt
Specifies the AON automation component issuing this request. The list of options follow:
- AON

- APPN
- IP390
- NVAIX
- SA
- SNA
- SNBU
- TCPIP
- X25

Return codes

0	No threshold has been exceeded.
1	Infrequent threshold has been reached.
2	Frequent threshold has been reached.
3	Critical threshold has been reached.
4	Incorrect parameters were used in the call.
5	Time-out or other error occurred.

Usage

The EZLEATHR routine accesses the control file to check the THRESHOLD entries and the status file to check the current status of the resource.

You can modify values for the EZLEATHR routine by defining them in the EXIT06 parameter of the ENVIRON EXIT control file entry. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information. AON uses the values on the ENVIRON EXIT control file entry unless you define a THRESHOLDS control file entry for the specific resource.

The EZLEATHR routine is used primarily to track error conditions that can be recursive. Because EZLEATHR tracks the errors, AON can notify operators of the recursive situation before it causes problems. After a critical threshold exception, AON deactivates resources to stop the recursive error and recovery.

A maximum of 10 errors can be stored in each record in the status file. These errors are stored in order of date and time-of-error. No details about the error are stored.

The VSAM key to the status file is built from the 8-character VTAM resource name. Only one status file record exists for each resource.

Each resource name in the status file must be unique; therefore, select your resource names carefully.

The EZLEATHR routine searches for the threshold in a predefined sequence to find the appropriate threshold. For a description of the threshold search sequence, refer to the *IBM Tivoli NetView for z/OS Administration Reference*.

AON is designed to fulfill most needs of thresholds automation processing. However, your installation might require you to tailor threshold automation processing. You can code AON user exits for threshold values for a specific resource. These values are specified on the THRESHOLDS statement or on the ENVIRON EXIT control file entry.

Example

This example shows the relationship between the EZLEATHR routine and the automation control file. The threshold to be checked is a user-defined name, PU001. The user module checks the thresholds by calling the EZLEATHR routine.

The automation control file entry is:

```
THRESHOLD PU001,CRIT=(8,02:00),FREQ=(4,04:00),INFR=(4,08:00)
```

The module to call the EZLEATHR routine is:

```
USERTHR  module
     &CGLOBAL ABC XYZ ... ...
     &TGLOBAL ABC XYZ ... ...
     EZLECAUT ...    check whether automation allowed and set

⋮
-AUTOOK
     EZLEATHR PU001 USER NEW
     &IF &RETCODE EQ 0 &THEN &GOTO -OKSOFAR
     &IF &RETCODE EQ 1 &THEN &GOTO -EXCEEDINFR
     &IF &RETCODE EQ 2 &THEN &GOTO -EXCEEDFREQ
     &IF &RETCODE EQ 3 &THEN &GOTO -EXCEEDCRIT
     otherwise, an error occurred, RC=4/5, log error msg
     &EXIT
-OKSOFAR
     perform whatever actions may be required if no thresholds
     have been exceeded
     &EXIT
-EXCEEDINFR
     perform whatever actions may be required if infrequent
     thresholds have been exceeded
     &EXIT
-EXCEEDFREQ
     perform whatever actions may be required if frequent
     thresholds have been exceeded
     &EXIT
-EXCEEDCRIT
     perform whatever actions may be required if critical
     thresholds have been exceeded.
     &EXIT
```

The THRESHOLD entries in the automation control file defined a critical threshold as 8 errors occurring in 2 hours, frequent threshold as 4 errors in 4 hours and infrequent threshold as 4 errors in 8 hours.

The user-written module initiates the EZLEATHR routine using resource name, resource type, and NEW. The error information is added to the status file and the thresholds are checked.

Upon return to the user-written module the *&RETCODE* value is checked. If the value indicates that a critical threshold has been exceeded, the module stops recovery, which is consistent with the message issued by the EZLEATHR routine.

Example

This example shows a REXX command list that uses the EZLEATHR routine:

```
/* REXX example of EZLEATHR usage */

/* Check thresholds */

 'EZLEATHR 'Resource' USER NEW'
 Thr_rc = Rc
```

```
select
  when Thr_rc = 0 then                               /* None exceeded*/
    do
      /* Actions for no threshold exceeded */
      exit
    end
  when Thr_rc = 1 then                               /* Infrequent   */
    do
      /* Infrequent Actions */
      exit
    end
  when Thr_rc = 2 then                               /* Frequent     */
    do
      /* Frequent Actions   */
      exit
    end
  when Thr_rc = 3 then                               /* Critical     */
    do
      /* Critical Exceeded, */
      /* terminate recovery */
      exit
    end
  Otherwise
    do
      'MSG LOG, ERROR: RETURN CODE 'Thr_RC' FROM EZLEATHR 'Resource
      exit
    end
end
```

INFORM Action (EZLECALL)

Purpose

EZLECALL is a REXX routine that generates an immediate INFORM action based on the notification policy. Enter the name of the individual or group policy to contact, and any message text required. EZLECALL does require that an INFORM/CONTACT policy entry exists for this purpose.

The INFORM command is a command synonym (CMDSYN) for EZLECALL.

Syntax

EZLECALL

```
►►──EZLECALL──policy_name──┬─────────┬──────────────────────────────►◄
                           └─message─┘
```

Parameters

policy_name
: Specifies the name of the INFORM policy or group name to use, which determines the individuals to contact.

message
: Specifies the message to be sent to the contact. The message must be consistent with the CONNECTION type specified in the INFORM policy. If no message is provided, the default INFORM message or the message specified in the INFORM policy is used.

Example

This example shows how the operator can issue an inform for the policy NITEOPS. The text following the policy is sent in an e-mail or to an alpha-pager.

```
INFORM NITEOPS PLEASE CALL THE OFFICE IMMEDIATELY
```

Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for additional information on how to set up your INFORM policy statements.

Using Active Monitoring and Recovery (EZLECATV)

Purpose

The EZLECATV routine tries to recover VTAM resources through the VTAM VARY INACT and VARY ACT commands at intervals specified in the MONIT control file entry. Recovery attempts continue until the resource becomes active, interval settings have been exhausted, automation is turned off, or an operator issues a command for that resource (VARY INACT or VARY ACT). If the notify flag for the interval is **Y**, the EZLECATV routine issues a reminder notification.

```
EZL507I resname HAS BEEN UNRECOVERABLE FOR duration
```

At the first interval, message EZL506I issues:

```
EZL506I  restype resname ON location
         INACTIVE - RECOVERY MONITORING HAS BEEN INITIATED
```

Keep the parameters for the EZLECATV routine in the same order as they are shown in the following syntax diagram.

Syntax

EZLECATV

```
►►──EZLECATV──resource──,res_type──,count──,gmtdate──,gmttime──────────────────►◄
```

Parameters

resource
: Resource name.

res_type
: Resource type.

count
: MONIT interval count of interval just run. Valid values are 0 through 99.

gmtdate
: Date of original failure that initiated recovery. The date is given in Greenwich mean time (GMT).

gmttime
: Time of original failure that initiated recovery. The time is given in Greenwich mean time (GMT).

Usage

Link stations and CDRM are not inactivated during recovery. All other resources are deactivated with a VARY INACT,F command to clear pending states. Activations are done with SCOPE=U for PUs and higher nodes. SCOPE=ONLY is used for LUs and CDRMs. Recovery is stopped if the resource becomes unknown to VTAM in consideration of dynamic CDRSCs. A timer is scheduled at the next MONIT interval with an ID of the resource names.

To tailor reminder interval automation processing code AON user exits for specific MONIT intervals for a resource. Set default exit values for EZLECATV on the MONIT statement or on the ENVIRON EXIT control file entry. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information about the

ENVIRON EXIT entry.

Checking Automation (EZLECAUT)

Purpose

The EZLECAUT routine checks recovery automation flags on the RECOVERY control file entry to determine whether automation is in effect for a resource.

Syntax

EZLECAUT

```
►►──EZLECAUT──res_name──┬──────────┬──────────────────────────────────►◄
                        └─res_type─┘
```

Parameters

res_name
The name of the resource for which to check automation settings

res_type
Type of resource being checked

Return codes

0	Automation is in effect.
1	Automation is not in effect.
2	Automation is defined, but not in effect because of a NOAUTO window.
4	Parameters that are not valid.

Usage

If a NOAUTO parameter is found, calculations determine whether the current time is within the NOAUTO window. The return code is set accordingly.

You can set defaults for the EZLECAUT routine by defining the EXIT07 parameter of the ENVIRON EXIT control file entry. To tailor recovery automation processing, code AON user exits for specific recovery processing.

Processing Generic Failures (EZLEFAIL)

Purpose

The EZLEFAIL routine processes resource failure events and drives option specific routines from the option tables. The following diagram illustrates the syntax of the EZLEFAIL routine and its parameters.

Syntax

EZLEFAIL

```
►►──EZLEFAIL──RESNAME=resourcename──RESTYPE=resourcetype──OPTION=optiontype────────►

                 ┌─,──────┐
►─TBLKEY=key──SKIP=(─▼─┬─A─┬─┴──) AUTOSTAT=status──┬─────────────────────┬──────────►◄
                       ├─C─┤                       │ ┌─,──────────────┐  │
                       ├─T─┤                       └─▼─keyword=value──┴──┘
                       ├─O─┤
                       ├─M─┤
                       ├─I─┤
                       ├─R─┤
                       └─H─┘
```

Parameters

RESNAME
Specifies the resource name.

RESTYPE
Specifies the resource type.

OPTION
Specifies the automation component:
- APPN
- IP390
- NVAIX
- SA
- SNA
- SNBU
- TCPIP
- X25

TBLKEY
Specifies unique handling for the event. The EZLEFAIL routine gets optional processing values from the TBLKEY parameter. If you do not specify the TBLKEY parameter for the EZLEFAIL routine, no optional processing or notification occurs. The values on the TBLKEY parameter specify keywords found in the option definition tables. In the option definition table, the keywords define the actual processing values used for optional processing. AON saves the TBLKEY values in the *outmsgid* and *spec_function* variables. Message EZL509I is the default *outmsgid*. The value of TBLKEY is in the following format:

```
tblkey_value=(outmsgid,spec_function_call)
```

For example, the EZLEFAIL routine is called with:

```
EZLEFAIL OPTION=SA MSGPRMS=(OPID) TBLKEY=IST105I RESNAME=resname
```

The EZLEFAIL routine gets the values specified on the IST105I keyword in the option definition table. In the option definition table, the values on the IST105I keyword are:

```
IST105I=(EZL531,FKVEAIDA(resname restype))
```

The EZLEFAIL routine issues the EZL531I message and runs FKVEAIDA as a function sending the current value of *resname* (resource name) and *restype* (resource type) for optional processing. An optional processing program performs automation or processing unique to the resource or failure. No optional processing is done and no message is issued if SKIP=(0) is specified on the EZLEFAIL call.

The EZLEFAIL routine issues message EZL509I or EZL510I to all logs and to DDF. EZL509I is issued for resources that continue to be unavailable when EZLEFAIL runs. EZL510I is issued for resources that have been recovered and are in an active state when EZLEFAIL runs. Operators do not receive these messages. These messages are not issued if SKIP=(A) is specified on the EZLEFAIL call.

SKIP
Specifies which processing to ignore:

A	Availability message is skipped.
C	Check automation processing is bypassed.
T	Threshold processing is skipped.
O	Option-specific processing (specified by TBLKEY value) is bypassed.
M	Option-specific message processing (TBLKEY value) is bypassed.
I	Do not gather resource-specific information.
R	Recovery attempt processing is bypassed. Setting the AIP operator status is also bypassed.
H	Do not check higher node status.

AUTOSTAT
Specifies the status.

keyword=*value*
Any valid keyword and value.

Return codes

00	EZLEFAIL completed successfully.
02	AON initialization has not completed, issue EZL003E.
03	Missing parameters, issue EZL203I.
04	Incorrect parameters: issue EZL204I.
05	Wait time expired: issue EZL205I.
06	Command failed: issue EZL206I.
07	NOVALUE variable found.
08	REXX syntax failure.
09	Initialization shipped to automation operator.
10	Can not find resource type/owning option.

11	Check recovery, option not enabled.
12	Check recovery, higher node down.
13	Check recovery, automation flag off.
14	Check recovery, resource in available state.
15	Check recovery, recovery timer exists.
16	Automation is defined, but not in effect because of a NOAUTO window.
21	Check thresholding: infrequent routine RC>0.
22	Check thresholding: frequent routine RC>0.
23	Check thresholding: critical routine RC>0.
30	Optional processing routine RC>0.

Example

The following example illustrates how you can call EZLEFAIL from the automation table:

```
IF MSGID='IST285I'
   & TEXT = . 'DUMP OF ' RESNAME ' FAILED - PERMANENT' .
   & HDRMTYPE = 'Q'
   THEN
     EXEC(CMD('EZLEFAIL OPTION=SA RESTYPE=NCP'
              ' RESNAME=' RESNAME
              ' SKIP=(C,T,R)'
              ' TBLKEY=IST285IO AUTOSTAT=NCPDUMP')
          ROUTE(ALL *));
```

The automation flag is not checked, threshold analysis is not performed, and recovery is not initiated. The status sent to DDF is NCPDUMP and IST205I. A keyword in the option definition table specifies any additional message or program to be called.

Example

This example shows AON/SNA automation being driven for VTAM message IST105I when a resource fails. EZLEFAIL is called out of the automation table for the AON/SNA subarea (SA) option. Other parameters passed to EZLEFAIL include TBLKEY that identifies an option definition table key to use for recovery of the resource. Additional Information is retrieved from the option definition table during the failure processing.

```
IF TEXT =  'IST105I' resname 'NODE' . & HDRMTYPE = 'Q'
   THEN
     EXEC(CMD('EZLEFAIL OPTION=SA MSGPRMS=(OPID) '
              'TBLKEY=IST105I '
              'RESNAME='resname));
```

Example

This example shows AON/SNA automation is driven for VTAM message IST619I when a resource fails. EZLEFAIL is called out of the automation for the AON/SNA subarea option. The option definition table key for additional recovery information and processes is IST619I. Additional information is retrieved from the option definition table during the failure processing.

```
IF MSGID='IST619I'
   & TEXT = . 'ID = ' resname ' FAILED' .
   & HDRMTYPE = 'Q'
   THEN
     EXEC(CMD('EZLEFAIL OPTION=SA TBLKEY=IST619I '
              ' RESNAME=' resname )
          'SKIP=(R)' ROUTE(ALL *));
```

Managing Automation Tables (AUTOCMD/EZLEF002)

Purpose

The AUTOCMD routine is used to enable, disable, insert, and get the status of automation tables. The following diagram illustrates the syntax of the AUTOCMD routine and its parameters.

Syntax

AUTOCMD

```
►►─AUTOCMD─┬─┤ Statement ├────┬──────────────────────────────────────────────►◄
           ├─┤ Single Table ├─┤
           ├─┤ Insert ├───────┤
           ├─┤ Swap ├─────────┤
           └─┤ Status ├───────┘
```

Statement:

```
├──┬─ ENABLES──┬─,tablename,labeltype,labelname────────────────────────────────┤
   └─ DISABLES─┘
```

Single Table:

```
├──┬─ ENABLE──┬─,tablename─────────────────────────────────────────────────────┤
   ├─ DISABLE─┤
   ├─ REMOVE──┤
   └─ STATUS──┘
```

Insert:

```
├── INSERT─,tablename,position,marker,listname─────────────────────────────────┤
```

SWAP:

```
├── SWAP─,tablename─,tablename2─┬─────────┬─┬──────────────┬────────────────────┤
                                └─,marker─┘ │   ┌─?─┐      │
                                            ├───┴───┴──────┤
                                            └─,listname────┘
```

SWAPI:

```
├── SWAPI─,tablename─,tablename2─┬─────────┬─┬──────────────┬───────────────────┤
                                 └─,marker─┘ │   ┌─?─┐      │
                                             ├───┴───┴──────┤
                                             └─,listname────┘
```

Status:

```
├── STATUS──,tablename────────────────────────────────────────────────────┤
```

Statusm:

```
├── STATUSM──,marker──────────────────────────────────────────────────────┤
```

Command	Synonym
AUTOCMD	EZLEF002

Parameters

ENABLES
Activates multiple automation tables.

DISABLES
Deactivates multiple automation tables.

ENABLE
Activates a single automation table.

DISABLE
Deactivates a single automation table.

INSERT
Loads an automation table in the position specified.

SWAP
Replaces an automation table with another automation table.

SWAPI
Replaces an automation table with another automation table and reestablishes all disabled elements.

STATUS
Returns the status of the specified table.

STATUSM
Returns the status of the table with the specified marker.

tablename
Specifies the name of the automation table to be affected by the chosen keyword.

tablename2
Specifies the name of the automation table that replaces *tablename*.

labeltype
Specifies the type of label to be altered as follows:
- LABEL
- ENDLABEL
- BLOCK
- GROUP
- SEQUENCE

labelname
Specifies a label name, which consists of 1–16 character label or 1–8 character sequence numbers in the automation table.

position
Specifies the position of the table to be loaded. The position specification follows:

1..n	The numerical position of the table.
FIRST	The table loads in the first position.
LAST	The table loads in the last position.
marker	Specifies a unique identifier associated with the table being loaded. Markers can be 1–8 characters in length and are optional.
listname	Specifies a unique name for the listing member associated with the automation table. A list name can be 1–8 characters. If the listing name is omitted, a unique name is created and a listing is generated, automatically. However, if *NONE* is provided as a parameter, then no listing is generated. This is considered an override. No informational messages are generated regarding an override of the listing with *NONE*.

Return codes

For STATUS and STATUSM, the return codes are as follows:

0	The search for the automation table or marker was successful.
4	The search for the automation table was not successful or an error occurred.

For all other return codes are as follows:

0	The request completed successfully.
n	The request failed. The error message can be found in the common global variable EZLERRMSG. The common variable stem EZLAUTOR contains messages generated by the request.

Usage

When loading or swapping tables that replace or become the automation table used by AON, it is necessary to update the EZLMSGTBL and EZLMSGLST global variables with the table name and listing name respectively. If AUTOMAN removes the AON table, then these variables are automatically reset.

Setting Panel Message Color (EZLEMCOL)

Purpose

Use EZLEMCOL to set panel variable attributes for non-AON messages such as VTAM and NetView messages.

Syntax

EZLEMCOL

```
►►──EZLEMCOL──(msgnum,msgtext)──────────────────────────────────────────►◄
```

Parameters

msgnum
: Message number

msgtext
: Message text

Usage

EZLEMCOL can also be called as a command.

Color settings are:

Information message	White
Warning message	White
Error message	Yellow
Action message	Red

Example

Following is a sample of REXX code using EZLEMCOL:

```
$ErrorMsg = EZLEMCOL(MsgId,MsgTxt)  /* set panel variable     */

'GLOBALV GETT EZLMSGCOLR'          /* get color attribute(s) */
$ERRORMSG = 'EZLMSGCOLR          /* set panel attribute(s) */
```

Formatting Panel Messages (EZLEMSG)

Purpose

EZLEMSG is a REXX function that builds messages to be sent to operators while they are viewing an AON panel.

Syntax

EZLEMSG

```
►►──PnlMsg──=──EZLEMSG──(msgnum,logupdate,clistname,parm1,parm2,...parmn)──────────►◄
```

Parameters

PnlMsg
The panel variable used to display the message. Upon return from EZLEMSG this variable is set to the complete message text with inserts included.

msgnum
Identifies the message to display.

logupdate
If *Y*, the message is passed back from the function call and is also be logged to the NetView log. If *N*, the message is returned from the function call and is not logged.

clistname
Used to identify the program issuing the message. This is required and issued if an error occurs to properly identify the failing program.

parm1
First insert for the message. This is optional.

parm2
Second insert for the message. This is optional.

parmn
Last insert for the message. This is optional.

Usage

The default message prefix is EZL. If you generate messages with other prefixes, code the prefix plus the message number. The parameters (*parm1* through *parmn*) are optional and are only required if the message substitutes variable information into the message text as a message insert.

Example

Following is a sample of REXX code using EZLEMCOL:

```
PnlMsg = EZLEMSG(901,'N',ident,sel,'1','5')
```

This statement sets the variable *PnlMsg* equal to the text of message EZL901I with inserts of the value of variable sel, 1, and 5:

```
PnlMsg = SELECTION 6 IS INVALID.  TYPE A NUMBER BETWEEN 1 AND 5
```

Driving the Inform Policy (EZLENFRM)

Syntax

EZLENFRM

```
►►──EZLENFRM── ──policy_name ──resname ──restype ──resdomain ──resstat ──────────►

►─aostat──────────────────────────────────────────────────────────────────────►◄
```

Purpose

EZLENFRM is a REXX routine called by the AON notification policy when an inform action is required. EZLENFRM can also be invoked by non-AON routines. EZLENFRM checks the inform policy, issues the inform actions, and logs the action, if indicated. All parameters are required and can be substituted in the resulting inform message.

Parameters

policy_name
: Specifies which INFORM policy or group name to use when determining who to contact.

resname
: The failing resource name

restype
: The failing resource type

resdomain
: The domain of the failing resource

resstat
: The status of the failing resource

aostat
: Automation status of the failing resource

Example

This example shows an invocation of EZLENFRM for policy NITEOPS. A CDRM that is down has reached the end of its monitoring intervals. The NITEOPS policy is consulted and appropriate actions is taken.

```
EZLENFRM NITEOPS NTB6MVS CDRM PACDR NOMOMONS
```

Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information about setting up INFORM policy statements.

Notify Policy List (EZLENTFY)

Purpose

EZLENTFY is a REXX routine called to query the AON Notify Policy for a given event type, resource, or resource type.

Syntax

EZLENTFY

```
►►──EZLENTFY──┬─event_type──────┬──────────────────────────────────────►◄
              ├─resname─────────┤
              ├─restype─────────┤
              └resname restype──┘
```

Parameters

event_type
: Query Notify Policy based on the type of event such as CRITTHRS.

resname
: Query Notify Policy based on the resource name. Wild cards are supported.

restype
: Query Notify Policy based on the resource type.

Usage

If any Notify Policy keywords are set to *NO*, they are not displayed in the Notify Policy List. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for additional information on the NOTIFY statement.

The Notify Policy List can be null. Any caller must be prepared to avoid issuing notifications with a null Notify Policy List.

The following INFORM Policy Names are not valid:
- MSG
- ALERT
- TEC
- DDF

EZLENTFY creates two task global variables:
- EZLNTFYLIST containing the list of notification actions. The format of the list is (Notify1, Notify2, ..., NotifyN)
- EZLNTFYTYPE containing the NOTIFY policy statement used.

User Exit (EXIT10) Functions:
- Override NOTIFY policy based on other criteria, such as your own notify policy database.
- Implement other notifications such as fax.

Setting the AIP User Status Bit (EZLERAIP)

Purpose

EZLERAIP is a REXX routine that enables the setting and resetting of the Automation in Progress (AIP) user status bit for resources being monitored or viewed in NetView management console (NMC). This routine handles the routing of the request to the domain specified in the control file. On the target domain, EZLERAIP routes the request to the appropriate AUTAIP autotask for processing. This routine can also update the Operator Intervention View (OIV) status, see the request types (*reqtype*) for specific information.

Syntax

EZLERAIP

```
►►──EZLERAIP ──resname,──restype,──reqtype,──other_netid,──nqn_netid,──────────────►

►─prev_domain,──gw_flag,──sscp_name───────────────────────────────────────────────►◄
```

Parameters

resname
The name of the resource.

restype
The *restype* parameter must be one of the following:
- CDRM
- LINE
- LINKSTA
- NCP
- PU

reqtype
The operation to be performed. The following values are supported:

SET Sets the AIP status for the resource.

RESET
Resets the AIP status for the resource.

SET/OIV
Sets the AIP status and removes the resource from the Operator Intervention View.

RESET/OIV
Resets the AIP status and adds the resource to the Operator Intervention View.

other_netid
The NETID of the resource if owned by another domain.

nqn_netid
The NETID of a resource as specified in its network qualified name.

prev_domain
An internal parameter that is filled in by the EZLERAIP call when it reroutes the request to the specified RODMDOM. All other calls must omit this parameter.

gw_flag
: When set to Y causes the AIP operator status to update for both the NCP and Gateway NCP resources. Otherwise, only the NCP resource changes.

sscp_name
: The VTAM SNA node name of the reporting VTAM. This is required only when the resource is owned by another VTAM domain.

Usage

- Commas are required between each of the parameters.

Routing Commands over Cross-Domain Sessions (EZLERCMD)

Purpose

EZLERCMD is a REXX routine that routes commands over cross-domain sessions. Both NetView-NetView Task (NNT) and remote command (RMTCMD) session types are supported.

Syntax

EZLERCMD

```
►►──EZLERCMD──domain_id,──┬───────────────┬──┬─NNT,────┬──┬─────────┬──command──────►◄
                          └─operator_id,──┘  └─RMTCMD,─┘  ├─,───────┤
                                                          └─NONCCF,─┘
```

Parameters

domain_id
Domain to which the command is sent.

operator_id
Operator to issue the command. This parameter is for RMTCMD sessions only.

NNT
Specifies that the session the command is routed over is an NNT session.

RMTCMD
Specifies that the session the command is routed over is an RMTCMD session.

NONCCF
If specified, the command is issued following CMD HIGH. Otherwise, it is issued following CMD HIGH NCCF.

command
The command and parameters to be routed.

Usage

The *operator_id* variable is required for RMTCMD sessions, but not for NNT sessions. No verification is performed on the command. It is routed as is to the target domain. If the specified operator is not logged onto the target domain, NetView establishes an RMTCMD session and issues the command upon session initialization. Ensure that the specified operator is logged on to the target domain before calling EZLERCMD.

Example

This example routes the LIST STATUS=OPS command over the active NNT session to domain CNM01.

```
EZLERCMD CNM01,,NNT,,LIST STATUS=OPS
```

Example

This example shows how to route the LIST STATUS=OPS command over the RMTCMD session to OPER1 on domain CNM01.

```
EZLERCMD CNM01,OPER1,RMTCMD,,LIST STATUS=OPS
```

Recovering Resources (EZLERECV)

Purpose

The EZLERECV routine is called for resource recovery and drives option specific routines from the option tables. The following diagram illustrates the syntax of the EZLERECV routine and its parameters. The AIP operator status is also cleared each time EZLERECV is called for a given resource.

Syntax

EZLERECV

```
►►──EZLERECV──RESNAME=resourcename──RESTYPE=resourcetype──OPTION=optiontype──────►


                      ┌─,───┐
►─TBLKEY=key──SKIP=(──▼─────┴──)──┬─────────────────────┬───────────────────────►◄
                        ├─I─┤       │ ┌─,─────────────┐ │
                        ├─A─┤       │ ▼               │ │
                        ├─R─┤       └───keyword=value─┴─┘
                        ├─S─┤
                        ├─O─┤
                        └─M─┘
```

Parameters

RESNAME
Specifies the resource name.

RESTYPE
Specifies the resource type.

OPTION
Specifies the automation option.

TBLKEY
Specifies unique handling for the event.

The EZLERECV routine gets optional processing values from the TBLKEY parameter. If you do not specify the TBLKEY parameter for the EZLERECV routine, no optional processing or notification occurs. The values on the TBLKEY parameter specify keywords found in the option definition tables. In the option definition table, the keywords define the actual processing values used for optional processing. AON saves the TBLKEY values in the *outmsgid* and *spec_function* variables. Message EZL504I is the default *outmsgid*. The value of TBLKEY is in the following format:

```
tblkey_value=(outmsgid,spec_function_call)
```

For example, if the EZLERECV routine is called with:

```
EZLERECV OPTION=SA MSGPRMS=(OPID) TBLKEY=IST093I RESNAME=resname
```

The EZLERECV routine gets the values specified on the IST093I keyword in the option definition table. In the option definition table, the values on the IST093I keyword are:

```
IST093I=(EZL517,FKVEAIDA(resname restype resstat opid))
```

The EZLERECV routine issues the EZL517I message and runs FKVEAIDA as a function sending the current value of *resname* (resource name) and *restype* (resource type) for optional processing. An optional processing program performs automation or processing unique to the resource or failure. No optional processing is done and no message is issued if SKIP=(0) is specified on the EZLERECV call.

The EZLERECV routine issues message EZL504I to all logs and to DDF. Operators do not receive this message. This message is not issued if SKIP=(A) is specified on the EZLERECV call.

SKIP
Specifies which processing to ignore:

I	Do not gather resource-specific information.
A	Skip availability message.
R	Bypass recovery stop processing.
S	Skip active monitoring restart.
O	Bypass option-specific processing (specified by TBLKEY value).
M	Bypass option-specific message processing (TBLKEY value).

*keyword***=***value*
Any valid keyword and value.

Return codes

00	EZLERECV completed successfully.
03	Missing parameters, issue EZL203I.
04	Incorrect parameters, issue EZL204I.
05	Wait time expired, issue EZL205I.
06	Command failed, issue EZL206I.
07	NOVALUE variable found.
08	REXX syntax failure.
09	Initialization shipped to automation operator.
10	Can not find resource type.
11	Option not enabled.
30	Optional processing routine RC>0.

Example

This example shows that AON/SNA automation is driven for VTAM message IST093I when a resource is reactivated. EZLERECV is called from the automation table for the AON/SNA SubArea option with optional parameters, such as TBLKEY=IST093I, to identify additional information for the resource recovery actions from the AON/SNA option definition table. Additional information is retrieved from the option definition table during the recovery processing.

```
IF MSGID='IST093I'
   & TEXT = 'IST093I ' resname 'ACTIVE'
   THEN
     EXEC(CMD('EZLERECV OPTION=SA TBLKEY=IST093I '
          'RESNAME=' resname ' MSGPRMS=(OPID)')
          ROUTE(ALL *));
```

Routing Commands to Other NetView Domains (EZLERGWY)

Purpose

EZLERGWY is a REXX routine that uses the RMTCMD command to route commands to other NetView domains.

Syntax

EZLERGWY

```
                       ┌─GATOPER autotask─┐
►►──EZLERGWY──targ_dom,─┴──────────────────┴─,─┬───────────┬─,─┬─────────┬──►◄
                         └─targ_op─┘            └─safe_name─┘   └─request─┘
```

Note: If *safe_name* is coded and contains data, *request* is optional.

Parameters

targ_dom
: The target NetView domain to which to route the request.

targ_op
: The target NetView operator ID to which to route the request. If not specified, the request is routed to the GATOPER autotask as defined in the CDLOG statements in EZLCFG01 in DSIPARM.

safe_name
: The name of the safe in which to store the response or from which to get the command. If you specify DSILOG, the output is only logged to DSILOG. If not specified, the command is routed and no response is logged or returned to the caller.

request
: The command to run.

Usage

To enable the remote gateway support, define CDLOG statements for the GATOPER autotask in each NetView domain. These statements are located in member EZLCFG01 in DSIPARM. Using these CDLOG definitions, AON establishes a RMTCMD session between the corresponding NetView domains. For more information, refer to the *IBM Tivoli NetView for z/OS Administration Reference*.

All parameters are positional and must be delimited by a comma. If you omit a parameter, use a comma to denote its absence.

No syntax checking or security checking is performed for the requested command.

To see the output from your command, specify a *safe_name* parameter. For debugging, specify DSILOG for the *safe_name* parameter.

If you are passing a command in the named safe (*safe_name*) parameter, make sure your program has placed data (the command) into the safe. If not, you receive message EZL203I. In this case, do not pass the command as a parameter.

Example

The following causes the LIST command to be routed to domain NTV6D with the output being placed into a named safe called MYSAFE:

```
EZLERGWY NTV6D,,,LIST
```

Since no *targ_op* was specified, GATOPER autotask in NTV6D is used.

Example

The following causes the LIST command to be routed to domain NTV6D. No output is returned to the calling program:

```
EZLERGWY NTV6D,,,LIST
```

Example

The following shows how to invoke EZLERGWY when the command to run is contained in a safe. In this case, the command is `LIST DSILOG` and is passed to EZLERGWY in a safe called `MYSAFE`. EZLERGWY builds the command, runs it, and returns the responses back into `MYSAFE`:

```
...
Command.0=2
Command.1='LIST '
Command.2='DSILOG'
"PIPE STEM Command.|Safe MYSAFE"

"EZLERGWY NTV6D,,MYSAFE,"

"PIPE SAFE Mysafe|Stem Myvar."
Do i=1 to myvar.0
   Say 'Response to command=' Myvar.i
End
```

Using this example, you can send commands longer than 255 bytes (NetView command-line restriction) to remote NetView domains.

Example

The following shows how to start a remote session from the GatOper (GATNTV6D) in domain NTV6D to domain NTVFE as RMTNTV6D:

```
CDLOG GATNTV6D,NTVFE,
      SESSTYPE=RMT,
      TARGOP=RMTNTV6D,
      INIT=YES,
       DESC='RMTCMD GATEWAY TO NTVFE'
```

TARGOP is optional for CDLOG and defaults to the same task name in the target domain. GATNTV6D is already be known to domain NTVFE as the NNT gateway task. Specify INIT=YES to start the session every time GATNTV6D logs on. DESC= is optional.

Routing NNT Cross-Domain Logon Information (EZLEROUT)

Purpose

EZLEROUT is a REXX routine that routes cross-domain logon information for NNT sessions and automates replies to NetView message DSI809A. You can also use EZLEROUT to route commands over RMTCMD sessions, similar to the EZLERCMD routine.

Syntax

EZLEROUT

```
►►──EZLEROUT──domain_id──,target_oper──,──┬──────────┬──────────────────────────►
                                           └─password─┘

►──┬─────────────────────────────┬──command──────────────────────────────────►◄
   ├─,NNT,profile,hcl_device,────┤
   └─RMTCMD,,,───────────────────┘
```

Parameters

domain_id
The domain to which you are logging on.

target_oper
The operator ID to which you are logging on.

password
The password to use.

NNT
Specifies that you are logging onto an NNT session.

profile
The NNT session profile.

hcl_device
The hard copy log device for the NNT session.

RMTCMD
Specifies that you are logging onto an RMTCMD session.

command
The command to be issued. Specifying YES for an NNT session runs the initial program defined in the operator logon profile, NNT-Profile. For RMTCMD sessions, this can be any valid NetView command or program (command list).

Example

This example shows how to route the LIST STATUS=OPS command over the active NNT session to domain CNM01. The routine uses the password OPERWORD, and the operator profile OPERPROF. The double-commas (,,) preceding the LIST STATUS=YES command indicate that the routine ignores the hard copy log device parameter.

```
EZLEROUT CNM01,,NNT,OPERWORD,OPERPROF,,LIST STATUS=OPS
```

Example

This example shows how to route the LIST STATUS=OPS command over the RMTCMD session to OPER1 on domain CNM01.

```
EZLEROUT CNM01,OPER1,,RMTCMD,,,LIST STATUS=OPS
```

Retrieving AON Information (EZLERTVE)

Purpose

The EZLERTVE routine retrieves data from AON option definition tables to use in automation modules.

Syntax

The following diagram illustrates the syntax of the EZLERTVE routine:

EZLERTVE

```
►►—EZLERTVE—┬——————————————————————————————┬——————————————————————————————►◄
            ├—EZLOPT option entry——————————┤
            └—EZLRT resource_type entry————┘
```

Parameters

EZLOPT
Specifies the option (AON feature) common global variables from the option definition tables.

EZLRT
Specifies the resource type common global variables from the option definition tables.

option
Installed AON feature or suboption. Valid option names are:

AON	AON base
APPN	Advanced Peer-to-Peer Networking (APPN) suboption for AON/SNA
IP390	TCP/IP for z/OS suboption of AON/TCP
NVAIX	NetView for UNIX suboption for AON/TCP
SA	Subarea suboption for AON/SNA
SNA	AON/SNA automation feature
SNBU	Switched network backup (SNBU) suboption for AON/SNA
TCPIP	AON/TCP automation feature
X25	X.25 suboption for AON/SNA

resource_type
Any valid resource type supported by AON or its automation features.

entry
Option definition table keyword.

Usage

The EZLERTVE routine must be called from a program, for example, REXX. The results are returned back to the calling program in a local variable, EZLERTVE.

The EZLERTVE routine accesses a variable name of *EZLOPT.option.entry* or *EZLRT.resource_type.entry* and returns the value of the common global variable.

If no value is found, EZLERTVE returns *N/A*.

Example

The following is an example of EZLERTVE in a REXX procedure:

```
  opt_id=SNA
  Restype=PU

  /* Get message class for option and resource type */
'EZLERTVE EZLOPT' opt_id 'MSGCLASS'
  opt_class = EZLERTVE
  'EZLERTVE EZLRT' Restype 'MSGCLASS'
  rt_class = EZLERTVE

  if rt_class = "N/A" then
    rt_class = "00"

  if opt_class = "N/A" then
    opt_class = "00"
```

The EZLERTVE routine gets the variable EZLOPT.SNA.MSGCLASS and the variable EZLRT.PU.MSGCLASS.

Issuing Resource State Reminders (EZLESRMD)

Purpose

The EZLESRMD routine checks the status of the resource and issues notifications if the resource is down. The resource is not recovered.

Syntax

EZLESRMD

```
►►──EZLESRMD──resource──,res_type──,count──,gmtdate──,gmttime──────────────────►◄
```

Parameters

resource
: Resource name.

res_type
: Resource type.

count
: MONIT interval count of the interval just run. Valid values are 0 through 99.

gmtdate
: Date of the original failure that initiated recovery. The date given is in Greenwich mean time (GMT).

gmttime
: Time of the original failure that initiated recovery. The time given is in Greenwich mean time (GMT).

Usage

A timer is scheduled at the next MONIT interval that has the ID of the resource name.

Monitoring is discontinued if the resource becomes unknown to VTAM in consideration of dynamic CDRSCs.

Monitoring continues until the resource becomes active, interval settings have been exhausted, or automation is turned off. If the notify flag for the interval is **Y**, a notification is issued:

```
REMINDER - restype resname HAS BEEN DOWN FOR interval
```

At the first interval, message EZL506I is issued:

```
resname INACTIVE - ATTEMPTING RECOVERY - RECOVERY MAY BE
TERMINATED BY VARYING THE RESOURCE INACTIVE
```

The EZL540I message is issued when reminders are halted (`REMINDERS FOR` *`restype resname`* `HALTED - REMINDER THRESHOLDS UNDEFINED`).

Stopping Cross-domain Sessions (EZLESTOP)

Purpose

EZLESTOP is a REXX routine supplied with AON to stop cross-domain NetView sessions. Both NNT and RMTCMD sessions are supported.

Syntax

EZLESTOP

```
►►──EZLESTOP──domain_id,──┬─────────────┬──────────────────────────────►◄
                          └─target_oper─┘
```

Parameters

domain_id
  Domain with which you have a session.

target_oper
  Operator to be logged off. This is valid only for RMTCMD sessions.

Usage

EZLESTOP determines the type of session based on the parameters that are provided. If the target operator is specified, then EZLESTOP looks for a RMTCMD session and logs that operator off. If you do not specify a target operator, EZLESTOP stops your NNT session to the specified domain.

Return codes

0	Session was ended.
4	Unable to stop cross-domain session. Check task global variable, EXITMSG, for the message that was received.
5	Internal AON error. Call IBM Software Support.
7	Internal AON error. Call IBM Software Support.
8	Internal AON error. Call IBM Software Support.

Example

This example logs operator OPER2T off a remote command (RMTCMD) session on domain CNM02.

```
EZLESTOP CNM02,OPER2T
```

Example

This example shows how to log off your NetView-NetView task (NNT) session with domain CNM02.

```
EZLESTOP CNM02
```

Starting Cross-domain Sessions (EZLESTRT)

Purpose

EZLESTRT is a REXX routine that starts cross-domain NetView sessions. The routine supports both NNT and RMTCMD type sessions.

Syntax

EZLESTRT

```
►►──EZLESTRT──domain_id,──target_oper,──┬───────────┬──────────────────────►
                                        └─password,─┘

►──┬─NNT,profile,hard_copy_device,logmode,─┬──initial_cmd──────────────────►◄
   └─RMTCMD,,,,────────────────────────────┘
```

Parameters

domain_id
: Target domain to start session.

target_oper
: Operator to be logged on.

password
: NNT password.

NNT
: Start a NetView-to-NetView Task session.

profile
: NNT operator profile.

hard_copy_device
: NNT hard–copy log device to start.

logmode
: Log mode for NNT session.

RMTCMD
: Start a remote command session.

initial_cmd
: Initial program or command to issue. For an NNT session, *YES* runs the initial program that is defined in the operator's logon profile. For RMTCMD sessions, this can be any valid NetView command or program.

Usage

Delimit all parameters with commas. If you do not specify a parameter, use two commas.

Return codes

0	Cross-domain session started.
4	Unable to start cross-domain session. Check the task global variable, EXITMSG, for the message that was received.
5	Internal AON error. Call IBM Software Support.
7	Internal AON error. Call IBM Software Support.
8	Internal AON error. Call IBM Software Support.

Example

This example shows how to start a cross-domain RMTCMD session to CNM02 as OPER2T:

```
EZLESTRT CNM02,OPER2T,,RMTCMD,,,,OPER2IC
```

The first occurrence of double-commas (,,) means that no password is passed. Other parameters not being passed are the *profile, hard_copy_device,* and *logmode*.

Example

This example shows how to start a cross-domain NNT session to CNM02 as OPER1 using a password of OPERPSWD and a logon profile of OPERPROF:

```
EZLESTRT CNM02,OPER1,OPERPSWD,NNT,OPERPROF,,,YES
```

No parameters are supplied for *hard_copy_device* and *logmode*. *YES* specifies to run the operator's initial program as defined in the profile OPERPROF when the session is established.

Activating VTAM Resources (EZLEVACT)

Purpose

Use the EZLEVACT REXX routine to reactivate VTAM resources. EZLEVACT issues a VARY NET,ACT command for a specified resource.

Syntax

EZLEVACT

```
►►──EZLEVACT──resource──────────────────────────────────────────────────►◄
```

Parameters

resource
The name of the VTAM resource to be activated.

Return codes

0	VARY ACT was successful.
8	WAIT error or resource is not known.
9	Security failure.
100	WAIT timeout.

Usage

EZLEVACT can be called from any NetView program or command processor.

Example

The following example shows how to activate resource TA1P523A:

```
EZLEVACT TA1P523A
```

Deactivating VTAM Resources (EZLEVINA)

Purpose

Use the EZLEVINA REXX routine to deactivate VTAM resources. EZLEVINA issues a VARY NET,INACT,F command for a specified resource.

Syntax

EZLEVINA

```
►►──EZLEVINA──resource──────────────────────────────────────────────►◄
```

Parameters

resource
The name of the resource to deactivate.

Return codes

0	VARY ACT was successful.
8	WAIT error or resource is not known.
9	Security failure.
100	WAIT timeout.

Usage

EZLEVINA can be called from any NetView program or command processor.

Example

The following example shows how to deactivate resource TA1P523A:

```
EZLEVINA TA1P523A
```

Moving VTAM Resources (EZLEVMOV)

Purpose

Use the EZLEVMOV REXX routine to move a PU from one line to another. EZLEVMOV issues a MODIFY NET,DR,TYPE=MOVE,FROM=*xxxx*,TO=*yyyy* command for a specified resource.

Syntax

EZLEVMOV

```
►►──EZLEVMOV──PU_name,──from_line,──to_line──────────────────────────────►◄
```

Parameters

PU_name
The name of the PU to move

from_line
The line to which the PU is currently attached

to_line
The line to which to move the PU

Return codes

0	MOVE was successful.
8	WAIT error, MOVE error, incorrect number of parameters.
9	Security failure.
100	WAIT timeout.

Usage

EZLEVMOV can be called from any NetView program or command processor. If you choose to move a PU, reactivate it after the move is complete. You can use the EZLEVACT for the reactivation.

Example

The following example shows how to move PU TA1P523A from line TA1L5023 to line TA1L5024:

```
EZLEVMOV TA1P523A,TA1L5023,TA1L5024
```

Sending MSUs to an MS Transport Application (EZLSMSU)

Purpose

EZLSMSU can be used to issue the NetView MS Transport send macro. To use EZLSMSU you must build a CP_MSU major vector and then invoke EZLSMSU to issue the send macro.

Syntax

EZLSMSU

```
►►──EZLSMSU──VARNAME=varname──┬─────────────────────────────┬──────────────────►
                              │             ┌─ALERT────┐    │
                              └─,DESTAPPL=──┴─destappl─┴────┘

►──┬──────────────────────────────────┬──┬───────────────────────────────┬──────►◄
   │           ┌─NetView domain─┐     │  │             ┌─AONALERT─┐      │
   └─,DESTLU=──┴─destlu─────────┴─────┘  └─,ORIGAPPL=──┴─origappl─┴──────┘
```

Parameters

varname
: Identifies the variable that contains a prebuilt CP_MSU. The variable is retrieved from your local variable pool. EZLSMSU does not perform data verification; it assumes that the CP_MSU was built correctly.

destappl
: Identifies the destination MS application for the send. If you do not specify a destination, the default (ALERT) is used and the MSU is sent to the NetView hardware monitor.

destlu
: Identifies the destination MS LU name for the send. For NetView applications, this is the NetView domain ID. If you do not specify a name, the default of the current NetView domain is used.

origappl
: Identifies the application originating the send request. If you do not specify an application, the default (AONALERT) is used.

Usage

No checking is done on your MSU data. All major vectors, subvectors, and subfields must be built properly. For more information refer to the SNA formats. The data sent to the hardware monitor (DESTAPPL=ALERT) can be an alert, a resolution, or an MSU containing multiple alerts or resolutions. To be notified when a send fails, code an MS Transport application and specify it for the ORIGAPPL. AON registers the AONALERT MS application during initialization. To see an example of how to build a CP_MSU acceptable for EZLSMSU, browse the EZLEMSU AON program.

Return codes

EZLSMSU returns RC=0 if the MSU was sent to the NetView MS Transport. If an error occurs, EZLSMSU returns the return code received from NetView. The return codes are documented in *IBM Tivoli NetView for z/OS Programming: PL/I and C*.

Example

The following example shows how to send the data built in the variable MSUDATA to the ALERT application (hardware monitor) running in your domain from the AONALERT application:

```
EZLSMSU VARNAME=MSUDATA
```

Example

The following example shows how to send the MSU data contained in the variable MSUDATA to the MYAPPL application in domain CNM1A from the MYAPPL application in your current NetView domain:

```
EZLSMSU VARNAME=MSUDATA,DESTAPPL=MYAPPL,DESTLU=CNM1A,ORIGAPPL=MYAPPL
```

Running Entry and Exit Traces (EZLTRACE)

Purpose

Use the EZLTRACE routine in modules and command processors to:
- Provide entry and exit tracing
- Control more detailed levels of tracing

Also, use this routine in your automation modules. Tracing is controlled at the operator panel.

Syntax

EZLTRACE

```
►►──EZLTRACE──┬─ENTRY─┬──command──┬─────────────┬──────────────────────────►◄
              └─EXIT──┘           ├─parm────────┤
                                  └─return_data─┘
```

ENTRY
    Indicates start of command
EXIT
    Indicates end of command
command
    The module being traced
parameters
    Input parameters passed to command (entry)
return_data
    Return values or return code (exit)

Usage

The *parameters* variables are written to the log when EZLTRACE ENTRY is run. The *return_data* variable is written to the log when EZLTRACE EXIT is run.

Local variables are set for use by either REXX or NetView command list language for detail tracing:
- EZLTRACEC - NetView command list program
- EZLTRACER - REXX
- Entry message
- Exit message

Example

Use the EZLTRACE routine in a REXX procedure to trace entries:

```
parse source . Invoc Ident .
parse upper arg argstring
'EZLTRACE ENTRY 'ident argstring                    /* Entry trace  */
interpret 'trace' EZLTRACER
```

Example

Use the EZLTRACE routine in a REXX procedure to trace exits:

```
ReturnCode = 4
'EZLTRACE EXIT 'ident ReturnCode                   /* Exit trace   */
exit ReturnCode
```

Example

Use the EZLTRACE routine in AON to avoid calls to EZLTRACE when trace is set to NONE:

```
  parse source . Invoc Ident .
  parse upper arg argstring
  'Globalv Getc EZLTRACED'
  If Substr(EZLTRACED,1,4)<> 'NONE'
  Then Do 'EZLTRACE ENTRY 'indent argstring
  Trace Value(EZLTRACER)
  End
```

Example

Use the EZLTRACE routine in a NetView command list to trace entries:

```
MYCODE CLIST
     &CONTROL ERR
     &IDENT = MYCODE
*
     EZLTRACE ENTRY &IDENT &PARMSTR
     &CONTROL &EZLTRACEC
*
```

Example

Use the EZLTRACE routine in a NetView command list to trace exits:

```
*
     &RETCODE = 99
     EZLTRACE EXIT &IDENT &RETCODE
     &EXIT &RETCODE
*
```

SNMP RFC Conversion (FKXECNVT)

Syntax

Use the FKXECNVT routine to read SNMP MIB RFCs and create entries that can be pasted into /etc/mibs.data.

FKXECNVT

```
►►──FKXECNVT──inddname──outddname──mibddname──────────────────────────────►◄
```

Parameters

inddname
Specifies the data set pointer to the input SNMP MIB RFC.

outddname
Specifies the data set pointer of where to put the output mibs.data entries.

mibddname
Specifies the data set pointer to the MIB OBJECT file.

Usage

The input file to FKXECNVT must be in textual format. FKXECNVT reads the MIB RFC line by line, and does not handle files stored in string format. Maximum LRECL for all files used by FKXECNVT is 256.

Example

```
FKXECNVT USER1.RFCDATA(TN3270E) USER.RFCDATA(TN32OUT)
NETVIEW.V5R2M0.CNMSAMP(FKXMOBJ)
```

This converts the MIB file named TN3270E to a mibs.data file called TN32OUT and uses FKXMOBJ from the NetView sample library as the base line for the conversion.

Messages

Following are error messages that can occur with the FKXECNVT function.

No Files

Explanation: No parameters were entered for this invocation.

Operator response: Retry the command specifying the Input, Output, and MIB files.

No Output File

Explanation: An output file name was not entered.

Operator response: Retry the command specifying the Input, Output, and MIB files.

No MIB Data File name was entered.

Explanation: Parameters were not entered for this invocation.

Operator response: Retry the command specifying the Input, Output, and MIB files.

Unable to allocate Input file indsn Return Code = RC

Explanation: The ALLOC command failed for file indsn.

Operator response: RC is the return code from the ALLOC command. Use this to determine why the allocate failed and resolve the problem and then retry the command.

Unable to allocate Output file outdsn Return Code = RC

Explanation: The ALLOC command failed for file outdsn.

Operator response: RC is the return code from the ALLOC command. Use this to determine why the allocate command failed, resolve the problem, and then retry the command.

Unable to allocate MIB Data file mibdata Return Code = RC

Explanation: The ALLOC command failed for file mibdata.

Operator response: RC is the return code from the ALLOC command. Use this to determine why the allocate command failed, resolve the problem, and then retry the command.

Unable to Read the MIB Data file, Received Return Code = RC

Explanation: The REXX EXECIO function failed with return code RC for the MIB data file.

Operator response: Use the RC to determine why the EXECIO function failed. Correct the problem and retry the command.

Unable to Write the Output file, Received Return Code = RC

Explanation: The REXX EXECIO function failed with return code RC for the Output file.

Operator response: Use the RC to determine why the EXECIO failed. Correct the problem and retry the command.

No valid records created for this RFC File

Explanation: FKXECNVT was unable to understand any objects in the input RFC file, so no converted records were created.

Operator response: Review the format of the RFC, and ensure it complies with the format restrictions defined in this book.

TCP/IP Command Support (IPCMD)

Syntax

Use the IPCMD routine to issue any TSO or UNIX command.

IPCMD

```
                      ┌─ procedure=CNMSTYLE.TCPNAME─┐   ┌─ SERVER=UNIX────────┐
►►──NETVASIS IPCMD────┼─────────────────────────────┼───┼─────────────────────┼──────►
                      └─ procedure=proc_name────────┘   └─ SERVER=server_name─┘

►─ CMD=command_&_parms──────────────────────────────────────────────────────────────►◄
```

Parameters

procedure
Specifies the z/OS procedure. Valid values are PROC and STACK.

proc_name
Specifies the name of the z/OS procedure. The default is defined in sample CNMSTYLE or its included members with the common global variable TCPNAME. The value for TCPNAME is the *proc_name* of the TCP/IP stack. Refer to *IBM Tivoli NetView for z/OS Administration Reference* for more information about setting this value.

SERVER
Specifies the server name, either TSO or UNIX. The default is .

CMD
Specifies the TCP/IP command and parameters.

Usage

- Specify NETVASIS when entering UNIX commands or commands that are case sensitive.
- Parameters are not positional, but enter CMD=*command_&_parms* last to enable proper parameter parsing.
- The default stack and server can be changed by modifying CNMSTYLE or its included members. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information.

Example

To use the UNIX server to ping host name localhost, using the default TCP/IP for z/OS stack name, enter the following command:

```
netvasis IPCMD CMD=oping localhost
```

The response is returned to the caller.

To use the first available TSO server to ping host name localhost, enter the following command:

```
netvasis IPCMD SERVER=TSO CMD=ping localhost
```

The response is returned to the caller.

Programmatic Interface for IP Trace

Syntax

IP Trace does not have a command-line interface. IP Trace uses an application programming interface and a series of common global variables that need to be set before invoking the IP Trace program. The following section provides information about these global variables. Refer to sample FKXETSMP shipped with the Tivoli NetView product for additional information.

To use IP Trace, the following required common global variables must be set.

For both Packet and Component Trace

FT.*sp*.*TARGET*

sp	The service point or stack for which these global variables are set.
target	The target system and stack where the trace commands are sent. The target is a stemmed variable, which consists of the NetView domain and TCP/IP procedure name of the stack, in the format DOMAIN.PROC for the stack defined by `sp`.

For Component Trace

FT.*sp*.CTRC.OPTS1
FT.*sp*.CTRC.OPTS2
FT.*sp*.CTRC.IPADD1
FT.*sp*.CTRC.IPADD2
FT.*sp*.CTRC.IPADD3
FT.*sp*.CTRC.IPADD4
FT.*sp*.CTRC.PORT
FT.*sp*.CTRC.JOBS
FT.*sp*.CTRC.ASIDS

sp	The service point or stack for which these global variables are set.
OPTS1	A list of CTRACE options. You can enter up to 20 options, separated by commas.
OPTS2	A list of up to 20 additional component trace options.
IPADD1	A list of IP addresses. You can enter up to four addresses.
IPADD2	A list of up to four additional IP addresses.
IPADD3	A list of up to four additional IP addresses.
IPADD4	A list of up to four additional IP addresses.
PORT	A list of up to 16 IP ports, in the range 0–65535.
JOBS	A list of up to 16 z/OS job names, from 1–8 characters.
ASIDS	A list of up to 16 z/OS address space identifiers, in the form of four hexadecimal numbers.

For Packet Trace

FT.*sp*.PKT.LINKS
FT.*sp*.PKT.OPT.*n*

This global variable contains a total count of optional globals defined for this service point. For example, if there are six FT.*sp*.PKT.OPT globals defined, the value of FT.*sp*.PKT.LINKS is 6. Any number of optional globals can be set for all links on a service point. Each of these globals contains the following format:

```
LinkName,Len,Proto,Ipadd,Subnet,DestPort,SourcePort
```

Note: Use one global for each service point. When using the 3270 interface, all of these global variables are managed automatically.

LinkName
The TCP/IP device name on the service point traced.

Len Specifies that a truncated portion of the IP packet can be traced. You can specify a length in the range 1–65535. The maximum value is FULL, which captures the entire packet.

Proto The protocol collecting data. Valid values are:
- Asterisk (*), which specifies that packets of any protocol are traced
- ICMP
- RAW
- TCP
- UDP
- *number* (in the range 0–255)

IPadd The IP address that is compared with both the source and destination addresses of inbound and outbound packets. If either the source or destination address of a packet matches the specified IP address, the packet is traced. If *IPadd* is blank or an asterisk (*) is specified, all IP addresses are traced.

Subnet The subnet mask that applies to the host and network portions of the IP address specified on the corresponding *IPadd*.

DestPort
The port number that is compared with the destination port of inbound and outbound packets. The port number is an integer in the range 1–65535. If the destination port of a packet is the same as the specified port number, the packet is traced. This comparison is only performed for packets using either the TCP or UDP protocol. Packets using other protocols are not traced. If *DestPort* is omitted, there is no checking of the destination port of packets. If an asterisk (*) is specified, packets of any protocol and any destination port are traced.

SourcePort
The port number that is compared with the source port of inbound and outbound packets. The port number is an integer in the range 1–65535. If the source port of a packet is the same as the specified port number, the packet is traced. This comparison is only performed for packets using either the TCP or UDP protocol. Packets using other protocols are not traced. If *SourcePort* is omitted, there is no checking of the source port of packets. If an asterisk (*) is specified, packets of any protocol and any source port are traced.

Syntax of FKXETRA1 Program

The format consists of the following:

```
FKXETRA1 sp,type,action,writer,chron_start_date_time,duration,operator
```

sp The service point ID. This variable directs FKXETRA1 to use global variables to properly set up the trace.

type The type of trace; CTRACE or PKT.

action To start (START) or stop (STOP) the trace.

writer The name of the source JCL used to create the external writer where trace data is stored. This is used for active and delayed traces. Refer to *MVS Diagnosis: Tools and Service Aids* for more information about creating source JCL for an external writer.

chron_start_date_time
The date and time to start the trace, in the format YYYY-MM-DD-HH.MM.SS. If no date and time is specified, the trace begins immediately. Refer to the CHRON command in the NetView online help for more information on the date and time format.

duration
The length of time the trace is to run, in the format HH.MM.SS. This is used for active and delayed traces. Refer to the CHRON command in the NetView online help for more information on the time format.

operator
The operator task on which to schedule a delayed trace timer for this request. A delayed timer can be set for a time when the requesting operator ID is not logged on to NetView, which causes the timer to fail. This option enables the user to specify the name of the task to be active at the designated time to allow for the successful completion of the task. The owner of the trace is still the original requestor.

Note: The task name must be defined in DSIPARM member DSIPOPF and can only be specified for delayed traces.

Usage

The IP Trace function utilizes many z/OS commands to control and manage TCP/IP component and packet traces. The following issues can effect the functionality of the AON IP Trace:

- Each task or operator requires a unique z/OS console to issue z/OS commands and receive command responses.
- The task with load module name CNMCSSIR must be active and receiving unsolicited messages.
- The time required to receive responses to IP trace commands can vary greatly. Customize the following statement in CNMSTYLE or its included members to set the time delay value (in seconds):

```
COMMON.EZLIPTraceJCLWait = 2 //AON wait time for source JCL errors response.
```

Example

To start Packet Tracing for YOURHOST, we need to set up the following common global variables:

```
FT.YOURHOST.PKT.LINKS   =  3
FT.YOURHOST.PKT.OPT.1   =  LOOPBACK,FULL,*,*,255.255.255.255,*,*
FT.YOURHOST.PKT.OPT.2   =  TCPIPLINK,FULL,*,*,255.255.255.255,*,*
FT.YOURHOST.PKT.OPT.3   =  TCPIPLINKN000000,FULL,*,*,255.255.255.255,*,*
FT.YOURHOST.TARGET      =  LOCAL.TCPIP
```

To start a packet trace on this system, now, code the following within a REXX Clist:

```
/*SAMPLE CODE TO START PKT TRACE NOW */

'FKXETRA1 YOURHOST,PKT,START,PKTWRITER'

SAY 'PKT TRACE REQUEST ENDED WITH RC' RC

/* DISPLAY FKX MESSAGE, TOO        */
'GLOBALV GETT EXLMSGTXT'

SAY EZLMSGTXT

EXIT
```

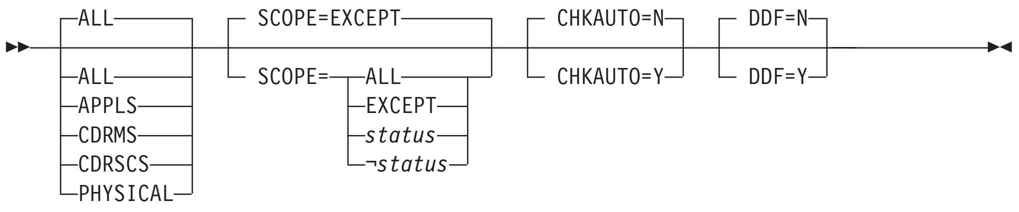
SNA Resource Automation (FKVESYNC)

Syntax

Quite often resources fail while NetView (or AON/SNA) is down. Because AON was not notified of the failure, AON automation routines do not request to recover the failed resources.

FKVESYNC is provided to assist you with automating your SNA resources. You can use FKVESYNC to determine which resources are down, and then drive AON automation routines to recover the failed resources.

FKVESYNC



Parameters

Defines which resource types to automate.

ALL
Automates all resources regardless of status. This is the default.

APPLS
Automates only the applications.

CDRMS
Automates only the cross-domain resource managers.

CDRSCS
Automates only the cross-domain resources.

PHYSICAL
Automates only the physical components. This includes NCPs, LUs, PUs, and switched nodes.

SCOPE
Defines the extent to which the resource is automated.

EXCEPT
Automates all resources that are currently not in an ACTIVE status. This is the default.

ALL
Automates all resources regardless of status.

status
Automates only resources with this status.

¬*status*
Automate all resources that do not have this status.

CHKAUTO
: Determines if the resources displayed are to be checked against the recovery statements in the control file when calling the NETSTAT command. The default is N.

DDF
: Determines if the information is passed to the Dynamic Display Facility (DDF) when calling the NETSTAT command. The default is N.

Usage

- FKVESYNC must be called from operator written code that is driven when NetView is initialized.
- FKVESYNC uses the AON NETSTAT command to determine the status of your SNA resources. In large networks with many failed resources, this process can take some time and CPU cycles.

Example

To check the status of all CDRMs, enter the following command:

```
FKVESYNC CDRMS
```

```
  CNM377I FKVESYNC : INPUT ACCEPTED AND BEING PROCESSED ...
   PLEASE WAIT
  EZL001I REQUEST NETSTAT WAS SUCCESSFUL FOR OPER4
```

This detects all of your failed CDRM resources and drives AON automation routines to attempt the recovery of each. When you see message EZL001I, then AON recovery has been driven for each failed resource.

Chapter 9. Tailoring Gateways and Focal Points

Gateways are inbound and outbound automated operators. Focal points are domains to which all notifications are forwarded. Gateways and focal points enable you to define the following:

- Focal point host
- Backup focal point host
- Intermediate host or hosts
- Distributed host or hosts
- Adjacent host environment or environments

The message/alert router forwards messages and alerts from multiple hosts to a single host. This enables a network operator to receive all the network alert messages at a single console. The message destination is controlled within control file entries. Routed messages contain host origination identification.

To enable notification forwarding for AON you must complete the following steps:

- Determine the notification forwarding hierarchy.
- Tailor the NetView definitions.
- Define the focal point and backup focal point entries.
- Define the outbound gateway operator entries.
- Add NetView outbound and inbound operator IDs.
- Implement the changes in a host-by-host approach.

Refer to the example following each step for more detail.

1. Determine the notification forwarding hierarchy.

   You must determine the relationship between the different systems in a notification forwarding network. You must designate a primary focal point where you can send the messages. You can designate a backup for the primary focal point for situations when the primary focal point is unavailable. You must define the connectivity between the hosts in a tree-structured hierarchy, so that all notification messages are forwarded up to the primary focal point.

   You should develop a chart depicting the notification forwarding hierarchy. Figure 26 on page 206 shows an example of a notification forwarding chart.

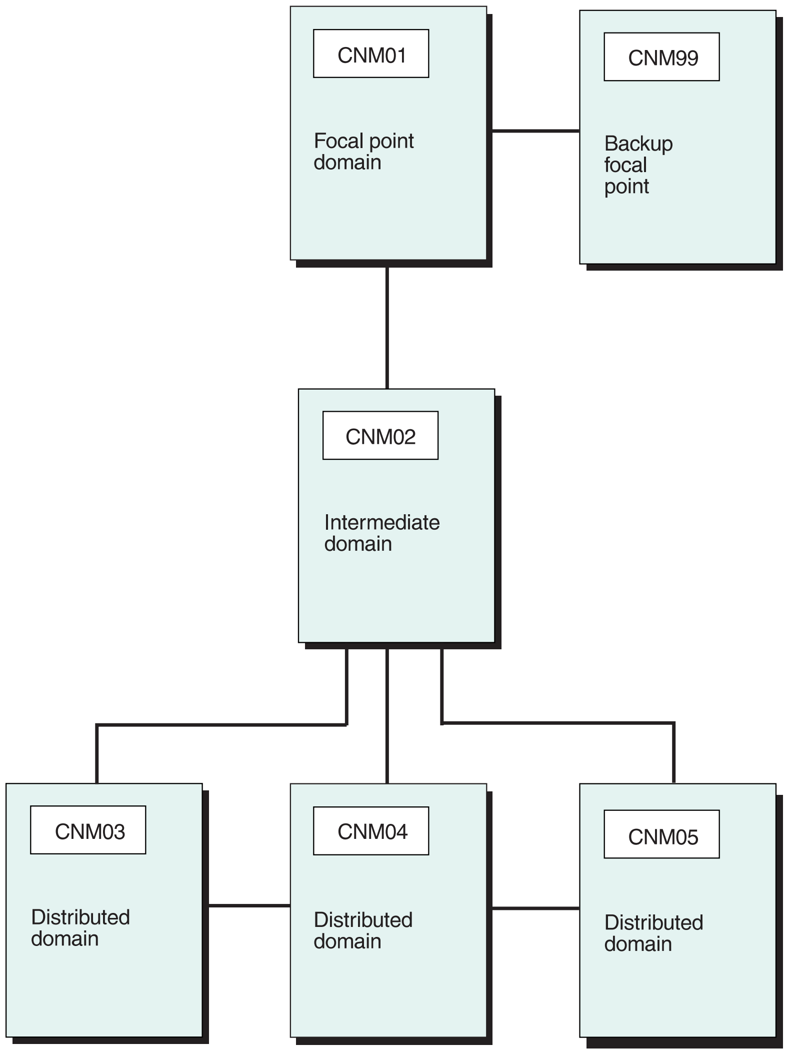


Figure 26. Notification Forwarding Hierarchy Chart Example

In this example, CNM01 is the primary focal point and CNM99 is the backup focal point. The backup focal point does not receive notifications unless the primary focal point is down. As soon as the primary focal point is operational and the gateway connections are reestablished, the backup stops receiving notifications.

2. Tailor the NetView definitions.

   Note: It is assumed that you have implemented all VTAM definitions required to permit cross-domain logons to remote NetView programs.

   Add an RRD statement (if one does not already exist) in CNMSTYLE or its included members for each host with which this host directly communicates. This definition supports notification forwarding.

3. Define the focal point and backup focal point entries.

   The focal point control file entry identifies the NetView domain where you forward the notification messages. Each focal point control file entry defines the final destination. Add a focal point definition control file entry to each distributed host.

   An example of a focal point definition entry is:

```
FORWARD FOCALPT,PRI=CNM01,BKUP=CNM03
```

4. Define the outbound gateway operator entries.

   The outbound gateway operator establishes and maintains all of the outbound connections to the domains defined in the GATEWAY control file entries. The outbound gateway operator is defined in the AUTOOPS entry of the control file as GATOPER.

   ```
   AUTOOPS   GATOPER,ID=name
   ```

   The GATEWAY entries define the other domains with which a session should be established so that notification messages can be forwarded to or from these domains.

   ```
   GATEWAY   CNM02,DESC='NETVIEW CNM02',PASSWORD=password
   ```

   NetView-NetView (NNT) sessions are established to all the domains defined by attempting to log on to the inbound gateway operator of each domain. Each inbound gateway operator has the same operator ID as the sending outbound gateway operator.

5. Define NetView outbound and inbound operator IDs to the DSIOPF profile.

   Define the inbound and outbound operator IDs to support notification forwarding. A sample operator ID (GATCNM01) is provided.

   Define one outbound operator ID. The outbound operator ID is the ID defined in the AUTOOPS GATOPER control file entry in your domain.

   Define one inbound operator ID for each domain defined in a GATEWAY control file entry. For the inbound operator ID, use the ID defined in the AUTOOPS GATOPER control file entry in the other domains.

   Note: You must also specify the logon ID in the GATEWAY statement of the remote domain.

6. Implement the changes in one NetView host at a time.

   The notification forwarding implementation is best approached as a top-down implementation starting with the primary focal point, then the distributed hosts. This approach works best because the focal point is ready to handle the forwarded notifications when notification forwarding is enabled in the remote hosts.

   When using a top-down approach, if your installation has not implemented message forwarding, the messages at the remote hosts are displayed to notification operators at the remote hosts. After message forwarding is turned on, the messages are routed to the focal point and appropriately handled. Local notification operators, if any remain, are also notified appropriately.

AON Focal Point Compatibility

The following restrictions apply to the AON-supported focal point compatibility:

- AON does not support intermediate focal point domains. You can use full-function domains as intermediate routing domains, but AON does not act on data passing through an intermediate routing domain, and does not update DDF in the intermediate domain.
- Down-level distributed domains must be directly connected to the focal point domain. You cannot use any ADJNETV statements.
- Down-level domains might not act as an intermediate. You cannot specify them in the DOMAIN or ALTNETV parameters on any ADJNETV statement.
- Down-level focal point domains must have all distributed domains directly connected. You cannot use any ADJNETV statements.

- Down-level compatibility is provided to ease migration to current levels of gateway support. Down-level compatibility is not intended for long-term production operation. Migration of all domains to full-function support should be accomplished as quickly as possible.

Table 9 illustrates allowable communications setups. Wherever a down-level domain is connected to a full-function domain, the full-function domain should be AON. Wherever two full-function domains are connected, the full-function domains can be any supported full-function product.

Table 9. Communications Setup in Focal Point Domain Environment

Focal point support 1. DL(dn) $\longrightarrow$ AON(fp) 2. AON(dn) $\longrightarrow$ DL(fp) (except AON SolutionPac) 3. FF(dn) $\longrightarrow$ FF(fp) 4. FF(dn) $\longrightarrow$ FF(ir) $\longrightarrow$ FF(fp)
SENDCMD support 1. DL $\longleftrightarrow$ AON[2] 2. AON $\longleftrightarrow$ DL[2] 3. FF $\longleftrightarrow$ FF 4. FF $\longleftrightarrow$ FF $\longleftrightarrow$ FF 5. DL $\longleftrightarrow$ AON $\longleftrightarrow$ DL[3] 6. DL $\longleftrightarrow$ AON $\longleftrightarrow$ FF[2, 3] 7. FF $\longleftrightarrow$ AON $\longleftrightarrow$ DL[2, 3]

Notes:

1. The abbreviations in this table have the following meanings:

AON	Full-function domain (AON)
FF	Full-function domain
DL	Any down-level domain
(dn)	Distributed domain
(fp)	Focal point domain
(ir)	Intermediate routing domain

2. SENDCMD support for these is the same.
3. Not valid for focal point support.

Figure 27 illustrates a typical migration environment:

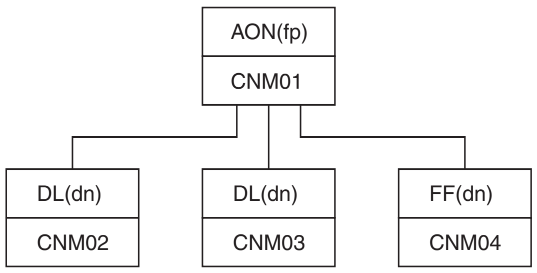


Figure 27. Typical Migration Environment

Table 10 on page 209 illustrates the focal-point and SENDCMD support for a typical migration environment.

Table 10. Focal–point and SENDCMD Support for Typical Migration Environment

Support type	Between domains	Communications setup
Focal point	CNM02 to CNM01	DL(dn) $\longrightarrow$ FF(fp)
	CNM03 to CNM01	DL(dn) $\longrightarrow$ FF(fp)
	CNM04 to CNM01	FF(dn) $\longrightarrow$ FF(fp)
SENDCMD	CNM02 to CNM01	DL $\longleftrightarrow$ FF
	CNM01 to CNM03	FF $\longleftrightarrow$ DL
	CNM04 to CNM01	FF $\longleftrightarrow$ FF
	CNM02 to CNM03 (through CNM01)	DL $\longleftrightarrow$ FF $\longleftrightarrow$ DL
	CNM02 to CNM04 (through CNM01)	DL $\longleftrightarrow$ FF $\longleftrightarrow$ FF
	CNM04 to CNM03 (through CNM01)	FF $\longleftrightarrow$ FF $\longleftrightarrow$ DL

Figure 28 shows one possible example of a full-function environment.

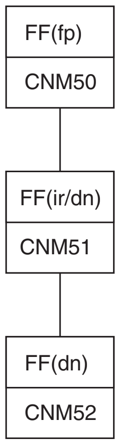


Figure 28. Example Full-function Environment Diagram

Table 11 lists focal-point and SENDCMD support for the full-function environment as previously illustrated.

Table 11. Focal-point and SENDCMD Support for Full-function Environment

Support type	Between domains	Communications setup
Focal point	CNM51 to CNM50	FF(dn) $\longrightarrow$ FF(fp)
	CNM52 to CNM50 through CNM51	FF(dn) $\longrightarrow$ FF(ir) $\longrightarrow$ FF(fp)
SENDCMD	CNM51 to CNM50	FF $\longleftrightarrow$ FF
	CNM52 to CNM50 through CNM01	FF $\longleftrightarrow$ FF $\longleftrightarrow$ FF

Sample definitions for this full-function environment for each domain follow:

- For domain CNM50:

```
AUTOOPS GATOPER,ID=GATCNM50
GATEWAY CNM51,PASSWORD=password
ADJNETV CNM52,DOMAIN=CNM51
```

- For domain CNM51:

```
AUTOOPS GATOPER,ID=GATCNM51
GATEWAY CNM50,PASSWORD=password
GATEWAY CNM52,PASSWORD=password
FORWARD FOCALPT,PRI=CNM50
```

- For domain CNM52:

```
AUTOOPS GATOPER,ID=GATCNM52
GATEWAY CNM51,PASSWORD=password
ADJNETV CNM50,DOMAIN=CNM51
FORWARD FOCALPT,PRI=CNM50
```

Notification Forwarding Example

Assume that the AON operator OUTMAN wants to forward a request (AON notify) to CNM02 from CNM01. The outbound gateway operator for CNM01 is Gating. The outbound gateway operator for CNM02 is Gating. The inbound gateway operator for CNM02 that receives notification messages from CNM01 is Gating.

The program sends the request to the CNM01 outbound gateway operator (GATCNM01). The outbound gateway operator determines if the request is for the CNM01 domain. In this example, it is not. The outbound gateway operator routes the request to the inbound gateway operator in domain CNM02 (GATCNM01) from domain CNM01. When the inbound gateway operator receives the request, it is sent to the outbound gateway operator for CNM02 (GATCNM02). The outbound gateway operator from CNM02 determines that the forwarded request is for this domain and issues the request. Refer to Figure 29.

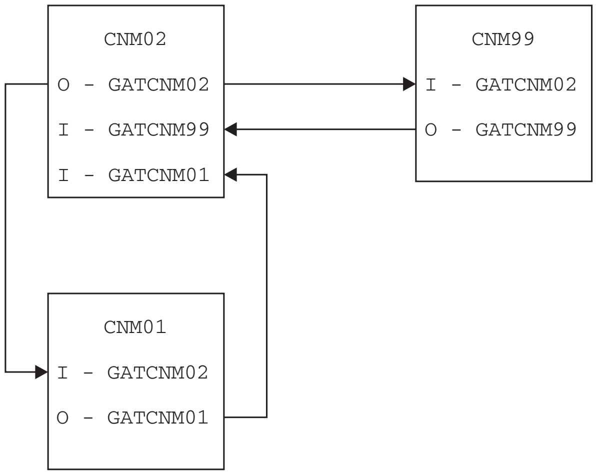


Figure 29. Notification Forwarding Example

Table 12 on page 211 lists the required control file entries for the domains illustrated in Figure 29.

Table 12. Required Control File Entries

Domain	Control file entry	Example
CNM01	AUTOOPS Automation operator	`AUTOOPS GATOPER,ID=GATCNM01`

	GATEWAY
	
	Forwarded domains and operator definitions
		`GATEWAY CNM02,DESC='NEXT DOMAIN',`
		`        PASSWORD=`*`pswd`*

	FORWARD FOCALPT Focal point definitions	`FORWARD FOCALPT,PRI=CNM99`
	ADJNETV Focal point definitions	`ADJNETV CNM99,DOMAIN=CNM02`
CNM02	AUTOOPS Automation operator	`AUTOOPS GATOPER,ID=GATCNM02`

	GATEWAY
	
	Forwarded domains and operator definitions
		`GATEWAY CNM99,DESC='NEXT DOMAIN',`
		`        PASSWORD=`*`pswd`*
		
		`GATEWAY CNM01,DESC='DOWNSTREAM',`
		`        PASSWORD=`*`pswd`*

	FORWARD FOCALPT Focal point definitions	`FORWARD FOCALPT,PRI=CNM99`
CNM99	AUTOOPS Automation operator	`AUTOOPS GATOPER,ID=GATCNM99`

	GATEWAY
	
	Forwarded domains and operator definitions
		`GATEWAY CNM02,DESC='DOWNSTREAM',`
		`        PASSWORD=`*`pswd`*

	FORWARD FOCALPT Focal point definitions	`FORWARD FOCALPT,PRI=CNM99`
	ADJNETV Focal point definitions	`ADJNETV CNM01,DOMAIN=CNM02`

Chapter 10. AON User Exits

With AON you can write user exits to tailor automation for a specific task. An exit can call any command, program, command list, or EXEC that can be issued from a NetView command line. Exits are processed by an automation operator, so processing restrictions that apply to automation operator-run programs also apply to exit programs. Refer to *IBM Tivoli NetView for z/OS Programming: REXX and the NetView Command List Language* for information about these restrictions.

User exits can both read and alter task global variables or return codes set by some common routines. These common routines guide further automation notification and logging or initiate activity based on failure or other conditions defined to AON. You can write exits that read and alter the task global variables and return codes when the following AON functions are issued:
- SNA resource information gathering (EZLEAGRN)
- Thresholds checking (EZLEATHR)
- Automation flag analysis based on recovery statements (EZLECAUT)
- Resource recovery attempts on MONIT intervals (EZLECATV)
- AON message issued to logs or operators
- NCP recovery

Exits invoked by common routines can be called with input parameters. Valid input parameters for exit routines include the task global variables available to the user exit (any of the task global variables listed in Table 14 on page 214 can be passed as a parameter by prefixing the task global variable name with an ampersand, thus creating a parameter such as &RESNAME or &RESTYPE, for example), user-defined literals, and the resource name sent to the common routine.

Exits to be called are defined in the control file. Default exits are coded on the ENVIRON EXIT entry. These exits are called every time the common routine is invoked. Table 13 identifies which routine calls which exit.

Table 13. Common Routines That Call Exits

Common routine	Policy entry that sets default	Control file entry that sets specific call
EZLEAGRN	ENVIRON EXIT (EXIT05)*	n/a
EZLEATHR	ENVIRON EXIT (EXIT06)*	THRESHOLDS
EZLECAUT	ENVIRON EXIT (EXIT07)*	RECOVERY
AON messaging	ENVIRON EXIT (EXIT08)*	n/a
EZLECATV	ENVIRON EXIT (EXIT09)*	MONIT
EZLENTFY	n/a	NOTIFY EXIT (EXIT10)
EZLENFRM	SETUP EXIT (EXIT11)+	n/a
EZLENFRM	SETUP EXIT (EXIT12)+	n/a
Note: Specific entries override the default entries. ***** Indicates that the entry is defined in the control file. **+** Indicates that the entry is defined in the Inform Policy member.		

You can also define different exits on the control file entry applicable to a particular resource or class of resources for each of the exit points (by using wildcard characters or resource types in definitions). These are defined on the RECOVERY, THRESHOLDS, and MONIT entries for the resource. You can specify up to 10 exits for each common routine. If you specify more than one exit routine, each exit is called until the first nonzero return code is received from the user-written exit routine. When multiple exits are called, AON uses the task global variable values set by the series of exits, up to and including the last exit issued. Table 14 identifies the task global variable values set by exits.

Table 14. Task Global Variables Available to User Exits

Common Routine	Exit Number	Policy Entry	Task Global Variable	Exit Task Global Variable	Issued
EZLEAGRN	EXIT05	n/a	RESNAME RESTYPE RESEXT RESSTAT RESMAJ RESLINE RESNODE RESPU RESSA RESSW	EZLEAGRNRC	Before EZLEAGRN returns control to the calling program.
EZLEATHR	EXIT06	THRESHOLDS*	RESNAME RESTYPE EZLTRSHLD EZLCRIT EZLFREQ EZLINFR EZLNONE	EZLEATHRRC	After the type of threshold exceeded is determined.
EZLECAUT	EXIT07	RECOVERY*	RESNAME RESTYPE RESEXT RESSAT RESMAJ RESLINE RESNODE RESPU RESSA RESSW EZLTIMERD EZLNWINDOW	EZLECAUTRC	Each time the recovery flag is checked for a resource.
AON Messaging	EXIT08	n/a	EZLCONVERT EZLMSGTXT	n/a	When issuing an AON message.
EZLECATV	EXIT09	MONIT*	RESNAME RESTYPE RESSTAT RESMAJ RESLINE RESNODE RESPU RESSA RESSW EZLINTVL EZLMONIT	EZLECATVRC	Prior to deactivation of a resource.

Table 14. Task Global Variables Available to User Exits (continued)

Common Routine	Exit Number	Policy Entry	Task Global Variable	Exit Task Global Variable	Issued
EZLENTFY	EXIT10	NOTIFY*	RESNAME RESTYPE RESEXT RESSTAT RESMAJ RESLINE RESNODE RESPU RESSA RESSW EZLTIMERD EZLNWINDOW EZLNTFYTYPE EZLINTVL EZLMONIT EZLNTFYLIST EZLTRSHLD EZLCRIT EZLFREQ EZLINFR EZLNONE	n/a	Prior to any notification actions.
EZLENFRM	EXIT11	SETUP+	EZLPOLEX	n/a	Prior to consulting the inform policy.
EZLENFRM	EXIT12	SETUP+		n/a	Prior to calling the inform interface routine.
Attention: The task global variables contain data that guides AON recovery processing. Indiscriminate changes to the task global variables can cause unpredictable results. * Indicates that the entry is defined in the control file. + Indicates that the entry is defined in the Inform Policy member.					

During initialization common global variables are set for the default exits for each exit point. If the ENVIRON EXIT control file entry is modified, reload the control file. The new exit common global variable values are changed. Exit definitions on the THRESHOLDS, RECOVERY, or MONIT entries take effect immediately and do not require the control file to be reloaded when they are updated online.

RESNAME
Name of the resource

RESTYPE
Type of resource, such as PU or IPHOST

RESEXT
For SNA resources; contains data from an IST0751 message (Display NET response)

RESSTAT
Current automation status of the resource

RESMAJ
For SNA resources; the major node that the resource is attached to

RESLINE
For SNA resources; the line that the resource is attached to

RESNODE
For SNA resources; the name of the higher resource that the current resource is attached to

RESPU
For SNA resources; the physical unit that the resource is attached to

RESSA
For SNA resources; the subarea that the resource is in

RESSW
For SNA resources; the switched major node that the resource is attached to

EZLNTIMERD
The time interval until the end of a NOAUTO window

EZLNWINDOW
The name of the RECOVERY policy definition used when in a NOAUTO window

EZLNTFYTYPE
The type of notification, such as REMIND

EZLINTVL
For SNA resources; the current MONIT interval number

EZLMONIT
For SNA resources; the next MONIT interval number.

EZLNTFYLIST
The list of Notify Actions, such as MSG or DDF

EZLTRSHLD
Set to the type of threshold condition, such as CRIT, FREQ, INFR or NONE

EZLCRIT
Flag that is set to Y when a Critical Threshold condition has occurred (Y, N)

EZLFREQ
Flag that is set to Y when a Frequent Threshold condition has occurred (Y, N)

EZLINFR
Flag that is set to Y when an Infrequent Threshold condition has occurred. (Y, N)

EZLNONE
Flag that is set to Y when no threshold condition has occurred (Y, N)

EXIT01 - EXIT04 Processing During NCP Recovery

With NCP recovery, you can specify user exits to run during different stages. Four separate user exit statements are used for each of the four stages where an exit can be used.

EXIT01	User-defined command or command list. The program defined in EXIT01 runs after the dump message response. Sample exit routines are provided (FKVEX01 in CNMSAMP).
EXIT02	User-defined command or command list. The program defined in the EXIT02 exit runs after the dump is complete and the dump time exceeded timer is purged. Sample exit routines are provided (FKVEX02 in CNMSAMP).
EXIT03	User-defined command or command list. The program defined in the EXIT03 exit runs after the reload message response. Sample exit routines are provided (FKVEX03 in CNMSAMP).
EXIT04	User-defined command or command list. The program defined in the EXIT04 exit runs after the load is complete and the load time exceeded timer is purged. Sample exit routines are provided (FKVEX04 in CNMSAMP).

Syntax

NCPRECOV

```
►►──NCPRECOV── ──ncpname──,HOST=domain──┬──────────────┬──┬──────────────┬──────────────►
                                        └─,EXIT01=cmd──┘  └─,EXIT02=cmd──┘

►──┬──────────────┬──┬──────────────┬────────────────────────────────────────────────►◄
   └─,EXIT03=cmd──┘  └─,EXIT04=cmd──┘
```

ncpname
: Specifies the NCP for which these exits are being used.

command
: Specifies an exit to be run or a command to be issued.

Usage

To use these exits, copy them into your user library from the DSICLD data sets.

If response to the option to dump the NCP is specified as N, then EXIT02 is not run because no message is received, thus indicating that a dump is complete.

If response to the option to load the NCP is specified as N, then EXIT04 is not run because no message is received, thus indicating that a load is complete.

Variable parameters cannot be passed for these exits. For example, USERPGM &NCP is not valid.

Attention: The task global variable (TGLOBALs) contain data that guides AON/SNA recovery processing. Indiscriminate changes to these task global variables (TGLOBALs) can cause unpredictable results.

Example

In the following example, AON runs the FKVEX01 exit when it replies to the request to dump message. AON runs the FKVEX02 exit when the dump is complete. AON runs the FKVEX03 exit when it responds to the reloading of the NCP. AON runs the FKVEX04 exit when it completes the reloading of the NCP.

```
NCPRECOV NCPABC,
         HOST=CNM01,DUMP=(Y,N),RELOAD=(Y,N),
         LINKSTA=123-S,DUMPSTA=123-S,
         LOADTIME=00:15,DUMPTIME=00:10,
         EXIT01=FKVEX01,
         EXIT02=FKVEX02,
         EXIT03=FKVEX03,
         EXIT04=FKVEX04
```

EXIT05 Processing (EZLEAGRN)

Purpose

Exit processing for EZLEAGRN is issued just before EZLEAGRN returns control to the calling program. AON gathers all information about a resource from a VTAM DISPLAY NET command and sets the following task global variables:

RESTYPE	Resource type
RESSTAT	Resource status
RESMAJ	The major node of the resource
RESLINE	The higher node line of the resource
RESNODE	The adjacent major node of the resource
RESPU	The higher node controller of the resource
RESSA	The subarea of the resource
RESSW	The switched major node of the resource

Any of these task global variables can be altered. The return code passed to the calling program by EZLEAGRN can be set from a user exit. The EZLEAGRN return code does not guide automation activity in AON, but the attribute can be adjusted by the exit. The altered return code is set by the user exit and placed in the task global variable, EZLEAGRNRC.

EZLEAGRN exits can be defined only in the control file on the ENVIRON EXIT by the EXIT05 parameter. The previously mentioned task global variables can be passed to the exit by specifying the task global variable name preceded by an ampersand (&). The resource name can also be passed to the exit routine by specifying &RESNAME.

Syntax

ENVIRON EXIT

```
                  ┌─,──────────────────────────────┐
                  ▼                                │
►►──ENVIRON EXIT────┬──────────────────────────────┬┴──────────────────►◄
                    └─EXIT05=─(─"command─┬───────┬─"─)─┘
                                         └─parms─┘
```

Parameters

command
Specifies the exit or command to be issued.

parms Specifies the parameters to be passed to the exit or the command to be issued.

Usage

A sample exit is provided in CNMSAMP member FKVEXT05.

Run all exits inline. Do not route exits to another task.

Code user exits to change any of the task global variables set by EZLEAGRN. These task global variables are set from the results of a VTAM DISPLAY command for the resource.

If any user-coded routines are written in REXX and a task global variable is changed, retrieve the new value by using the REXX 'GLOBALV GETT' statement.

Set task global variable EZLEAGRNRC in the user exit to alter the return code for EZLEAGRN.

All defined user exits are called in the order they are coded in the control file. All exits are issued until the user exit returns a nonzero return code. This return code is different from the return code set in task global variable EZLEAGRNRC.

EXIT05 can be used to change resource data used by AON or set additional task global variables from running other commands or message processing. For example, you can set up additional resource types to be used to guide recovery flags and DDF logging by analyzing the resource name and changing the RESTYPE task global variable.

Attention: The task global variables contain data that guides AON recovery processing. Indiscriminate changes to the task global variables can cause unpredictable results.

Example

For this example, each time EZLEAGRN is issued, FKVEXT05 is issued and passed the value of RESNAME as the first parameter, the literal TEST as the second parameter, and the value of task global variable RESTYPE as the third parameter.

```
ENVIRON EXIT,EXIT05=("FKVEXT05 &RESNAME TEST &RESTYPE")
```

EXIT06 Processing (EZLEATHR)

Purpose

Exit processing for EZLEATHR is issued after EZLEATHR performs threshold analysis and before operator notifications have been issued. The resource name and type must be passed to EZLEATHR. AON sets the following task global variables in EZLEATHR:

RESTYPE	Resource type
EZLTRSHLD	Threshold exceeded value (NONE,CRIT,FREQ,INFR)
EZLRECORD	Specifies whether this error is to be saved in the status file (Y,N)
EZLNOTIFY	Specifies whether any operator notifications are to take place (Y,N)
EZLCRIT	Indicates whether a critical threshold has been exceeded (Y,N)
EZLFREQ	Indicates whether a frequent threshold has been exceeded (Y,N)
EZLINFR	Indicates whether an infrequent threshold has been exceeded (Y,N)

The return code passed to the calling program by EZLEATHR can be set from EXIT06. The altered return code is set by EXIT06 and placed in the task global variable EZLEATHRRC. The return codes from EZLEATHR are used by calling programs to determine which threshold has been exceeded and if automation should continue.

Table 15. EZLEATHR results

If EZLEATHR determines...	...then....
a critical threshold has been exceeded	a return code of 3 is passed back to the calling program.
a frequent threshold has been exceeded	a return code of 2 is passed back to the calling program.
an infrequent threshold has been exceeded	a return code of 1 is passed back to the calling program.

EZLEATHR exits can be defined in the control file on the ENVIRON EXIT by the EXIT06 parameter or on the THRESHOLDS control file entry. Task global variables can be passed to the exit by specifying the task global variable name preceded by an ampersand (&). Resource names can also be passed to the exit routine by specifying &RESNAME.

Syntax

ENVIRON EXIT

```
                  ┌─,──────────────────────────────────┐
                  ▼                                    │
►►──ENVIRON EXIT──┴─┬────────────────────────────────┬─┴──────────────────►◄
                    └─EXIT06=─(─"command─┬───────┬─"─)┘
                                         └─parms─┘
```

THRESHOLDS entry for the specific resource:

THRESHOLDS

```
                          ┌─,──────────────────────────────────┐
                          ▼                                    │
►►──THRESHOLDS──resource─────┬──────────────────────────────┬──┴──────────────►◄
                             └─EXIT06=─(─"command─┬───────┬─"─)─┘
                                                  └─parms─┘
```

Parameters

command
Specifies the exit or command to be issued.

parms Specifies the parameters to be passed to the exit or command to be issued.

Usage

A sample exit is provided in CNMSAMP member EZLEXT06.

Run all exits inline. Do not route exits to another task.

Code user exits to change any of the task global variables set by EZLEATHR.

If any user-coded routines are written in REXX and a task global variable is changed, retrieve the new value by the use of the REXX ’GLOBALV GETT’ statement.

Set task global variable EZLEATHRRC in the user exit to alter the return code for EZLEATHR.

If an exit parameter is coded on the THRESHOLDS entry, the exits coded on the THRESHOLDS entry are issued.

All defined user exits are called in the order they are coded in the control file. All exits are issued until the user exit returns a non-zero return code. This return code is different from the return code set in task global variable EZLEATHRRC.

If the threshold exceeded type is altered, make the change in the EZLTRSHLD task global variable.

EXIT06 can be used to change the thresholding analysis results used by AON to guide automation and notifications based on thresholds exceeded. This might be desirable if there are no other factors influencing failure rates or resources which are not available to AON. EXIT06 can also perform some function based on thresholding exceptions, but not necessarily change the results of the analysis.

Attention: The task global variables contain data that guides AON recovery processing. Indiscriminate changes to the task global variables can cause unpredictable results.

Example

For this example, each time the THRESHOLDS FLAG is checked for resource ABPU, EZLEXT06 is issued and passed the value of the task global variable RESNAME as the first parameter, the value of task global variable RESTYPE as the second parameter, and the type of threshold that was exceeded as the third parameter:

```
THRESHOLDS ABPU,
           CRIT=(4,00:12),
           FREQ=(4,01:00),
           INFR=(5,24:00),
           EXIT06=("EZLEXT06 &RESNAME &RESTYPE &EZLTRSHLD")
```

EXIT07 Processing (EZLECAUT)

Purpose

Exit processing for EZLECAUT is issued when AON checks the automation status of a resource. Automation status is set by analyzing the RECOVERY AUTO and NOAUTO parameters entries. However, if the EZLECAUT higher node of the resource is inactive, AON not analyze the RECOVERY entries. In this case, EXIT07 not be called. For example, if EZLECAUT is called with ABPU and the line ABLINE1 associated with ABPU is not in an active state, exit processing not be issued for resource ABPU.

AON uses the EZLECAUT return code to determine whether automation is on or off for the resource. A return code greater that zero (0) indicates automation should not occur. A return code of zero (0) indicates automation is to proceed. The return code passed to the calling program by EZLECAUT can be set from a user exit. The altered return code is set by the user exit and placed in the task global variable EZLECAUTRC.

EZLECAUT exits can be defined in the control file on the ENVIRON EXIT by the EXIT07 parameter and the RECOVERY entry that applies to the resource. The previously mentioned task global variables can be passed to the exit by specifying the task global variable name preceded by an ampersand (&). The resource name can also be passed to the exit routine by specifying &RESNAME.

Syntax

ENVIRON EXIT

```
                 ┌─,──────────────────────────────────┐
                 ▼                                    │
▶▶──ENVIRON EXIT───┬────────────────────────────────┬─┴──────────────────────────▶◀
                   └─EXIT07=─(─"command─┬───────┬─"─)─┘
                                        └─parms─┘
```

RECOVERY

```
                                        ┌─,──────────────────────────────────┐
                                        ▼                                    │
▶▶──RECOVERY──resource,AUTO=Y─────────────┬────────────────────────────────┬─┴───────▶◀
                                          └─EXIT07=─(─"command─┬───────┬─"─)─┘
                                                               └─parms─┘
```

Parameters

resource	Specifies the resource name.
command	Specifies the exit or command to be issued.
parms	Specifies the parameters to be passed to the exit or the command to be issued.

Usage

A sample exit is provided in CNMSAMP member EZLEXT07.

Run all exits inline. Do not route exits to another task.

Code user exits to change task global variables set by EZLECAUT. These task global variables are set from the results of a VTAM DISPLAY command for the resource.

If any user-coded routines are written in REXX and a task global variable is changed, retrieve the new value by the use of the REXX ’GLOBALV GETT’ statement.

Set task global variable EZLECAUTRC in the user exit to alter the return code for EZLECAUT.

If an exit parameter is coded on the RECOVERY entry, the exits coded on the RECOVERY entry be issued.

All defined user exits be called in the order they are coded in the control file. All exits are issued until the user exit returns a nonzero return code. This return code is different from the return code set in task global variable EZLECAUTRC.

A return code of zero from EZLECAUT indicates that recovery for this resource is to continue. Any other return code from EZLECAUT indicates that automation should stop.

If the parameters sent to EZLECAUT include the resource name, type and higher node name, EZLEAGRN is not called for the resource. If any of those parameters are missing, EZLEAGRN is issued to retrieve the resource type. As a result EXIT05 is issued for the resource. Standard AON processing sends only the resource name; therefore, each call to EZLECAUT and EXIT07 can cause an execution of EZLEAGRN and EXIT05.

You can use EXIT07 to influence the automation flag and AON recovery activity based on data not readily available to AON. For example, the EXIT checks a database, schedule, or issue commands to an other equipment manufacturer (OEM) device to further determine whether resource recovery is appropriate. EXIT07 can also initiate some activities that do not change the automation flag; however, that should occur only because AON has detected an error condition.

Attention: The task global variables contain data that guides AON recovery processing. Indiscriminate changes to the task global variables can cause unpredictable results.

Example

For this example, each time the RECOVERY FLAG is checked for resource ABPU, EZLEXT07 is issued and passed the value of the task global variable RESNAME as the first parameter and the value of task global variable RESTYPE as the second parameter:

```
RECOVERY ABPU,
        AUTO=Y,
        EXIT07=("EZLEXT07 &RESNAME &RESTYPE")
```

EXIT08 Processing (AON Messaging)

Purpose

The AON messaging exit enables you to run your own program when an AON message is sent to operators. EXIT08 is defined on the ENVIRON EXIT entry and is specified by the EXIT08 parameter.

The AON messaging exit enables you to analyze the resource name and type and assign a new valid AON message class for this resource when an alert is to be sent to a focal point (either AON or the system operations component of System Automation for z/OS).

The resource name, type, and any user defined parameters can be passed to the user exit defined in the EXIT08 parameter. The parameters are received by the exit in the order that they are passed. A sample exit has been provided in CNMSAMP (EZLEXT08). The assigned message class or classes are stored in the task global variable EZLCONVERT. If multiple message classes are assigned, the classes must be separated by blanks. Any return code set by the user exit be ignored. The resource name and resource type can be passed to the exit by specifying the RESNAME and RESTYPE respectively.

You can also pass the message text using variable MSGTEXT,EZLMSGTXT or referring to the task global variable EZLMSGTXT in your program. Your program can then send the message to other operator notification devices like pagers or status boards. It can initiate a note in an electronic mail system. Most external notification devices have workstation interfaces that can be accessed from a service point. Some service points can be driven by NetView or z/OS commands issued from NetView programs.

Syntax

ENVIRON EXIT

```
                    ┌─,─────────────────────────────────┐
                    ▼                                   │
►►──ENVIRON EXIT────┴─┬───────────────────────────────┬─┴──────────────────►◄
                      └─EXIT08=─(─"command─┬───────┬─"─)─┘
                                           └─parms─┘
```

Parameters

command	Specifies the exit or command to be issued
parms	Specifies parameters that are to be passed to the exit routine

Usage

A sample exit is provided in CNMSAMP member EZLEXT08.

Run all exits inline. Do not route exits to another task.

All return codes from the user exit be ignored.

Return message classes in task global variable EZLCONVERT. Message classes are a maximum of 2 characters separated by blanks.

Attention: The task global variables contain data that guides AON recovery processing. Indiscriminate changes to the task global variables can cause unpredictable results.

Example

In this example, EZLEXT08 is issued when a message is issued:

```
ENVIRON EXIT,EXIT08=("EZLEXT08 &RESNAME &RESTYPE")
```

EZLEXT08 is passed the values for resource name and resource type.

EXIT09 Processing (EZLECATV)

Purpose

Exit processing for EZLECATV is issued after the MONIT interval data is returned and before activation or deactivation of the resource occurs. You can set the following TGLOBALs to influence recovery in EXIT09:

EZLNXTINTVL	Change this value to indicate whether MONIT intervals are to continue. The default is yes (Y).
EZLNOTIFY	Change this value to specify a different notify flag for the current MONIT interval (can suppress or force operator reminder notification on this interval).
EZLSCOPE	Change this value to specify the scope parameter for VTAM VARY ACT command. The default scope value is U for NCPs, lines, and PUs.
EZLACT	Change this value to specify whether to attempt to activate the resource. Valid values are yes (Y) and no (N). The default is yes (Y).
EZLINACT	Change this value to specify whether to attempt to deactivate the resource. Valid values are yes (Y) and no (N). The default is no (N) for resource types of LINKSTA or CDRSC, otherwise the default is yes (Y).
EZLMONIT	This value cannot be changed but can be passed to the exit. This TGLOBAL contains the MONIT value that is currently being run.
EZLINTVL	This value cannot be changed but can be passed to the exit. This TGLOBAL contains the number of the MONIT interval currently being processed.
RESTYPE	Change this value to change the resource type of the resource.

The return code passed to the calling program by EZLECATV can be set from EXIT09. The altered return code is set by the user exit and placed in the TGLOBAL EZLECATVRC. The return code from EZLECATV is not used by AON for automation.

EZLECATV exits can be defined in the control file on the ENVIRON EXIT or the MONIT entries by the EXIT09 parameter. The resource name and resource type can be passed to the exit by specifying the &RESNAME and &RESTYPE respectively.

Syntax

ENVIRON EXIT

```
                    ┌─,──────────────────────────────┐
                    ▼                                │
►►──ENVIRON EXIT─────┬────────────────────────────┬──┴──────────────────────────►◄
                     └─EXIT09=─(─"command──┬───────┬─"─)─┘
                                           └─parms─┘
```

Special exit routines can be coded for specific resources on the MONIT entry for the specific resource MONIT.

MONIT

```
                     ┌,──────────────────────────────────┐
                     ▼                                   │
►►──MONIT──resource───┬──────────────────────────────────┬┴─────────────────────►◄
                      └─EXIT09=─(─"command─┬───────┬─"─)─┘
                                           └─parms─┘
```

Parameters

command Specifies the exit to be run or the command to be issued.

parms Specifies the parameters to be passed to the exit or the command to be issued.

Usage

A sample exit is provided in CNMSAMP member FKVEXT09.

Run all exits inline. Do not route exits to another task.

Code user exits to change the TGLOBALs set by EZLECATV.

If any user-coded routines are written in REXX and a TGLOBAL is changed, retrieve the new value by using the REXX 'GLOBALV GETT' statement.

Set TGLOBAL EZLECATVRC in the user exit to alter the return code for EZLECATV.

All defined user exits be called in the order they are coded in the control file. All exits be run until the user exit returns a non-zero return code. This return code is different from the return code set in TGLOBAL EZLECATVRC.

EXIT09 can be used to change the way AON recovers a resource, or class of resources by setting the TGLOBALs. EXIT09 can be used to perform some function which is desirable each time a recovery interval is processed, but not necessarily change the AON recovery logic.

Attention: The TGLOBALs contain data that guides AON recovery processing. Indiscriminate changes to the TGLOBALs can cause unpredictable results.

Example

In this example, on each MONIT interval for resource ABPU, FKVEXT09 be run and passed the value of the TGLOBAL RESNAME as the first parameter, the value of TGLOBAL RESTYPE as the second parameter, the number that represents the MONIT interval cycle as the third parameter, and the MONIT value for this interval:

```
MONIT ABPU,
      INTVL=(00:02,Y),
      INTVL=(00:04,N),
      EXIT09=("FKVEXT09 &RESNAME &RESTYPE &EZLINTVL &EZLMONIT")
```

EXIT10 Processing (EZLENTFY)

Purpose

Exit processing for EZLENTFY is issued during AON notification processing. EZLENTFY builds a list of notification types which can be overridden in EXIT10. You can set the following task globals to influence how AON performs notification processing:

EZLNTFYLIST
This global variable contains a list of notification actions. The list can be one or more of the following:
- ALERT
- TEC
- MSG
- DDF
- Inform_Policy_Name

EZLNTFYTYPE
This global variable contains the type of notification requested. This can be a resource name, resource type (for example PU), or event type (for example CRITTHRS).

Syntax

```
►►──NOTIFY──┬─DEFAULTS───┬──┬──────────────────────────────────────────────────────────┬──────►
            ├─ResType────┤  │          ┌─NO──┐           ┌─NO─────────────────┐        │
            ├─ResName────┤  └─ALERT=──┼─YES─┼──INFORM=──┴─Inform_Policy_Name─┴────────┘
            ├─Res*───────┤            └─TEC─┘
            └─Event_Type─┘

►──┬────────────────┬──┬────────────────┬──┬───────────────────────────────────┬────────────►◄
   │      ┌─NO──┐   │  │      ┌─NO──┐   │  └─EXIT10=─"command──┬─────────┬─"──┘
   └─MSG=─┴─YES─┴───┘  └─DDF=─┴─YES─┴───┘                      └─parms───┘
```

Parameters

DEFAULTS
Notification policy at a system wide, or defaults, level

ResType
Notification policy based on a type of resource

ResName
Notification policy based on a particular resource name

Res* Notification policy based on a range of resource names

Event_Type
Event_Type can be one of the following:

CRITTHRS
Critical automation threshold exceeded

NOMOMONS
No more monitoring intervals defined

REMIND
Reminder that a resource is still down

BRGCONGEST
Bridge Congestion Threshold exceeded

ADPCONGEST
Adapter Congestion Threshold exceeded

NAMESERV
NameServer Failure Threshold exceeded

ALERT
Specifies when to generate MSU notifications. MSUs are required for Tivoli Enterprise Console events.

YES	Specifies to generate an MSU.
NO	Specifies do not generate an MSU. No is also the default.
TEC	Specifies to generate an MSU so that the Tivoli Enterprise Console receive the notification.

INFORM
Specifies the use of pager/beeper or e-mail that is defined in the CONTACT entry statement of the Inform Policy. You can use different resources and resource types.

MSG
Specifies whether to generate a message or not.

YES	Specifies to display a message.
NO	Specifies not to display a message. No is the default.

DDF
Specifies how the DDF component is updated.

YES	Log the event to DDF.
NO	Do not log events to DDF. No is the default.

EXIT10
Is a user exit that enables the override of any of the notification actions.

command
Specifies the exit or command to be issued.

parms
Specifies the parameters that are to be passed to the exit routine.

Usage

It is possible for EXIT10 to be driven without any notification policy defined. In that case, EZLNTFYLST be null. This would occur if the defined policy has been customized to not issue any notifications. The user exit can then enable particular notifications.

Example

In the following example, CLIST TEXIT10 be called to override the existing notification policy in EZLNTFYLST for a specific resource:

```
NOTIFY PU0001,MSG=YES,DDF=NO,ALERT=TEC,INFORM=NO,EXIT10=TEXIT10 &RESNAME
```

EXIT11 and EXIT12 Inform Policy Processing

Purpose

EXIT11 and EXIT12 enable you to alter the inform policy processing.

EXIT11 is called prior to inform policy processing and can be used to dynamically change the inform policy name, group name, or provide a list of policy or group names as needed to insure the appropriate contacts are made.

EXIT12 is called after inform policy processing and before invoking the interface specified in the policy, enabling the inform action to be changed.

Syntax

SETUP

```
►►─┬───────────────────────────────────────────────┬─┬─────────────────┬──────────►
   └─SETUP ─┬───────────────────────────────────┬─┘ │       ┌─NO──┐   │
            └─CONNECTIONS=──connections──────────┘   └─,LOG=─┴─YES─┴───┘

                                          ┌─AUTOINF─┐
►─┬───────────────────────────────────┬─,LOGTASK=─┴─taskid──┴──────────────────────►
  │             ┌─EZLIFLOG───┐        │
  └─,MEMBER=────┴─membername─┴────────┘

            ┌─current domain─┐
►─,SPDOM=───┴─domainid───────┴──┬────────────────────────────────────────┬────────►
                                └─EXIT11=─(─"preprocessing_exit"─)───────┘

►─┬──────────────────────────────────────────┬────────────────────────────────────►◄
  └─EXIT12=─(─"postprocessing_exit"─)────────┘
```

Parameters

CONNECTIONS
A list of additionally supported connection types. If an interface supports FAX, then FAX must be added to the SETUP CONNECTIONS parameter. It is not necessary to add NUMPAGE, ALPHAPAGE, or EMAIL to this list.

LOG
Set the LOG keyword to YES if you want the INFORM Log enabled. When enabled, selected INFORM actions are logged, and this list can be displayed using the full screen AON function, ILOG. ILOG enables each INFORM action to be deleted, acknowledged, or reissued as needed. Because I/O is required, the default for SETUP LOG is `NO`. Actions caused by the use of the INFORM command are not logged.

MEMBER
If LOG=YES is specified, then *membername* is the member that AON INFORM uses to write the log records. The records are written to the first data set name found in the DSILIST data set definition. If no member name is specified, EZLIFLOG is used by default. The write protection key >INFORM or the first line of the member starting in column 1 is written. Therefore, the INFORM log function overwrites only other INFORM logs.

LOGTASK
The INFORM log requires an autotask for the sequencing of all updates. If the log is enabled, the autotask indicated is started, or AUTOINF is started by default.

SPDOM
The domain ID of the network NetView that owns the INFORM service point or application. The current domain is the default.

EXIT11
EXIT11 is invoked prior to checking the in-storage inform policy information.

preprocessing_exit
Specifies the pre-processing exit for the inform policy. For information on the parameters that are passed, see "Usage."

EXIT12
EXIT12 is called prior to invoking the interface specified in the inform policy.

postprocessing_exit
Specifies the post-processing exit for the inform policy. The parameters passed to EXIT12 are the same as those passed to the INTERFACE routine. For more information on the parameters that are passed, see "Usage."

Usage

When EXIT11 is called from EZLENFRM or a notification policy, it receives the policy name, resource name, resource type, domain ID, resource status, and automation status. When EXIT11 is called from EZLECALL or the INFORM command, it receives the policy name and the domain ID. The return codes that can be set by the exit are:

0	Continue normal inform policy processing.
4	Continue normal inform policy processing using changed information. This new information is specified using a task global variable EZLPOLEX which contains the value policy name or group name or list of common delimited policy and group names.
8	Discontinue processing. This enables linkage to other inform technologies without returning to this inform policy flow.

When EXIT12 is called prior to invoking the inform action routine, it receives information related to the inform action. Refer to the EZLENETF sample in the CNMCLST data set for a description and the format of these parameters. The return codes that can be set by the exit are:

0	Call the interface code as specified in the inform policy contact statement.
n	Discontinue processing. Before returning this value you can call other interface routines directly.

EXIT13 Socket Monitoring

Purpose

EXIT13 enables you to prevent the STOP and ACTIVATE commands from being issued against a socket. It also enables you to override the STOP or ACTIVATE commands.

EXIT13 is called for both STOP and ACTIVATE processing.

Syntax

IPPORT

```
►►──IPPORT── ──Socket_Name──┬───────────────────┬──────────────────────────────►
                            └─,──SP=──stack_name─┘

►─┬──────────────────────────┬──┬─────────────────────────┬────────────────────►
  └─,──PORT=──Port_Num─ | *──┘  └─,──TELNET=──┬─NO──┬──────┘
                                              └─YES─┘

►─┬──────────────────────┬──┬──────────────────────────────┬──────────────────►
  └─,──TCPNAME=──User_ID─┘  └─,──PROTOCOL=──Port_Type──────┘

►─┬──────────────────────────┬──┬──────────────────────────┬──┬──────────────────────┬──►
  └─,──SESSTAT=──┬─YES─┬─────┘  └─,──CMDTYPE=──┬─MVS──┬────┘  └─,──INTVL=──Interval──┘
                 └─NO──┘                       ├─TSO──┤
                                               ├─UNIX─┤
                                               └─NETV─┘

►─┬──────────────────┬──┬──────────────────────────────────┬──────────────────►
  └─,──DELAY=──Mins──┘  └─,──ACTIVATE=──"Start_Command"────┘

►─┬──────────────────────────────┬──┬──────────────────────────────┬──────────►
  └─,──STOP=──"Stop_Command"─────┘  └─,──EXIT13=──"User_Exit"──────┘

►─┬──────────────────────────┬──┬───────────────────────────┬──┬─────────────────────┬──►
  └─,──DESC=──"User_Text"────┘  └─,──ACTMON=──Actmon_Def────┘  └─,──FORMAT=──PORT────┘

►─┬────────────────────────────────────────────────┬──────────────────────────►◄
  └─,──STATUS=──(──status1,....,statusn──)─────────┘
```

Usage

You can use Exit13 to prevent the STOP and ACTIVATE commands from being issued against a socket, or to override the STOP or ACTIVATE commands. Exit13 be called for both STOP and ACTIVATE processing. The input that is available to this exit includes the following task global variables:

FKX_Command
STOP or ACTIVATE command as coded in the socket policy

FKX_Delay
Delay time between STOP and ACTIVATE commands

FKX_Action
Identifies type of action, STOP or ACTIVATE

FKX_CmdType
Identifies the type of command z/OS, NETV, TSO, or UNIX

You can choose the following task global variables with this exit:

FKX_Command
Modifies the STOP or ACTIVATE command

FKX_Delay
Modifies the delay time between the STOP and ACTIVATE commands

FKX_CmdType
Modifies the type of command, z/OS , NETV, TSO, or UNIX

When zero (0) is the return code either the STOP or ACTIVATE command runs.

When a nonzero return code is received from the user exit, the STOP command not be issued, a DELAY is not valid, and the user exit attempt to process the ACTIVATE command. If the nonzero return code is for an ACTIVATE command, ACTIVATE not be attempted. AON recovery monitoring still occur.

EXIT14 SNMP MIB Polling

Purpose

EXIT14 is driven during SNMP MIB polling processing. AON/TCP has retrieved the status of a resource interface table (IFTable).

EXIT14 enables you to perform further processing, such as retrieving the IpAddr Table from the resource to correlate the interfaces of the resource with their IP addresses.

EXIT14 can be coded for any of the IP390 resource definitions in the following list. For complete syntax, refer to the *IBM Tivoli NetView for z/OS Administration Reference.*

- IPHOST
- IPINFC
- IPNAMESERV
- IPROUTER
- IPTN3270

Note: Because EXIT14 is used during SNMP MIB polling, specify FORMAT=SNMP on your resource definitions.

Syntax

IPROUTER

```
►►─IPROUTER─ ─AON_Name─,─SP=─stack_name─,─OPTION=─IP390──────────────────►

►─,─IPADDR=─ipaddr─,─HOSTNAME=─host_name─┬───────────────────┬──────────►
                                         └─,─INTVL=─interval─┘

►─┬─────────────────────┬─┬─────────────────────┬───────────────────────►
  └─ACTMON=─Actmon_Def──┘ └─,─FORMAT=─┬─PING─┬──┘
                                      └─SNMP─┘

►─┬─────────────────────────────────────┬───────────────────────────────►
  └─,─STATUS=─(─status1, ...,statusn─)──┘

►─┬──────────────────────────────────────────────┬─┬─────────────────┬─►
  └─MIBVARn=─(─mib_var,operator,value─)─ ...─────┘ └─CORRELATE─┬─N─┬─┘
                                                               └─Y─┘

►─┬───────────────────────────────┬─┬───────────────────────────────┬──►◄
  └─,─EXIT14=─'─FKXEXT14 ...─'────┘ └─,─EXIT15=─'─FKXEXT15 ...─'────┘
```

Parameters

AON_Name
The unique name associated with the router that is used by AON/TCP.

Stack_Name
The name of the z/OS stack to use for TCP/IP commands. This name is synonymous with the z/OS service point.

OPTION=IP390
The only valid entry is IP390.

IPADDR
| The IP address. Alphabetical characters are not valid.

HOSTNAME
Indicates the fully qualified TCP/IP host name, using up to 30 characters including dots. The *host_name* variable is case-sensitive. The following is an example of a host name:

```
mrpres.whitehouse.capital.usa
```

INTERVAL
Defines the monitoring interval in hh:mm format. This is required for proactive monitoring. If the interval is defined for IPSTAT but not specified monitoring not occur.

ACTMON_Def
Defines active monitoring for groups of resources in the network. For additional information refer to the *IBM Tivoli NetView for z/OS Administration Reference.*

FORMAT
Specifies one of the following options to be used to determine the resource status:

PING Pings the resource to check its status.

SNMP
Uses SNMP MIB polling to check the status of the resource.

STATUS
Defines the expected (AON) status of the resource.

MIBVARn
Multiple MIBVAR statements can be defined and are needed only for SNMP thresholding (requires FORMAT=SNMP).

CORRELATE Y|N
Set to Y for trap correlation of IPHOSTs/IPROUTERs/IPTN3270s and their respective interface. The CORRELATE parameter should only be set to Y for resources when SNMP is available. All known interfaces are used to correlate the status. Use the CORRELATE parameter only for interfaces installed on critical IPHOSTs or IPROUTERs. N is the default.

EXIT14
Defines additional processing of SNMP interface table. The default value is NONE. Invoked for FORMAT=SNMP.

EXIT15
Defines additional processing of user defined thresholds (MIBVAR). The default value is NONE.

Example

The following example defines ROUTER1 as part of the NYROUTERS policy grouping to be monitored every 15 minutes through SNMP MIB polling:

```
ACTMON    IP390,OPTION=IP390,INTVL=01:,STATUS=NORMAL
ACTMON    IPROUTER,OPTION=IP390,INTVL=00:30,STATUS=NORMAL
ACTMON    NYROUTERS,OPTION=IP390,INTVL=00:15,
          FORMAT=SNMP
```

```
IPROUTER  ROUTER1,
          SP=NMPIPL10,
          OPTION=IP390,
          IPADDR=1.2.3.4,
          HOSTNAME=yourhost.plant.floor.co,
          ACTMON=NYROUTERS,
          EXIT14=MYEXIT14
```

EXIT15 SNMP MIB Thresholding

Purpose

EXIT15 is driven during SNMP MIB Thresholding processing. AON/TCP has issued SNMP GET requests for each MIBVARx variable for a given resource.

EXIT15 enables you to perform further processing such as determining which MIB variable and value did not meet the threshold specification.

EXIT15 can be coded for any IP390 resource definition in the following list. For additional information refer to the *IBM Tivoli NetView for z/OS Administration Reference*.

- IPHOST
- IPINFC
- INPNAMESERV
- IPROUTER
- IPTN3270

IPHOST

```
►►──IPHOST── ──AON_Name──,──SP=──stack_name──,──OPTION=──IP390──────────────────►

►─,──IPADDR=──ipaddr──,──HOSTNAME=──host_name──┬─────────────────────┬──────────►
                                               └─,──INTVL=──interval─┘

►─┬──────────────────────┬─┬──────────────────────┬──────────────────────────────►
  └─ACTMON=──Actmon_Def──┘ └─,──FORMAT=──┬─PING─┬─┘
                                         └─SNMP─┘

►─┬──────────────────────────────────────────┬───────────────────────────────────►
  └─,──STATUS=──(────status1, ...,statusn──)─┘

►─┬───────────────────────────────────────────────────────────┬──────────────────►
  └─MIBVAR1, ..., MIBVARn=──(──mib_var,operator,value──)──────┘

►─┬─────────────────────┬─┬──────────────────────────────┬───────────────────────►
  │          ┌─N─┐      │ └─,──EXIT14=──FKXEXT14 ...─────┘
  └─CORRELATE─┤   ├─────┘
             └─Y─┘

►─┬──────────────────────────────┬──────────────────────────────────────────────►◄
  └─,──EXIT15=──FKXEXT15 ...─────┘
```

AON_Name
The unique name associated with the TCP/IP host that is used by AON/TCP.

MVS_Stack_Name
The name of the MVS stack to use for TCP/IP commands. This name is synonymous with the MVS service point.

OPTION=IP390
Only valid entry is IP390.

IPADDR
| Consists of IP addresses up to 17 characters in length. Alphabetical characters
| are not valid.

HOSTNAME
Indicates the fully qualified TCP/IP host name, using up to 30 characters including dots. The *host_name* variable is case-sensitive. The following is an example of a host_name:

```
mrpres.whitehouse.capital.usa
```

INTERVAL
Defines the monitoring interval in hh:mm format. This is required for proactive monitoring.

ACTMON_Def
Defines active monitoring for groups of resources in the network. For additional information, refer to the *IBM Tivoli NetView for z/OS Administration Reference.*

FORMAT
Specifies one of the following options to be used to determine the status of the resource.

PING Pings the resource to check its status.

SNMP
Uses SNMP MIB polling to check the status of the resource.

STATUS
Defines the expected (AON) status of the resource.

MIBVAR1 – n
Multiple MIBVAR statements can be defined and is needed only for SNMP thresholding (requires FORMAT=SNMP).

CORRELATE Y|N
Set to Y for trap correlation of IPHOSTs/IPROUTERs/IPTN3270s and their respective interface. The CORRELATE parameter should only be set to Y for resources when SNMP is available. All known interfaces are used to correlate the status. Use the CORRELATE parameter only for interfaces installed on critical IPHOSTs or IPROUTERs. N is the default.

EXIT14
Defines additional processing of SNMP interface table. The default value is NONE. Invoked for FORMAT=SNMP.

EXIT15
Defines additional processing of user defined thresholds (MIBVAR). The default value is NONE.

Example:

The following example defines host yourhost for proactive monitoring using SNMP polling, looking for a status of NORMAL, THRESH*, or DEGR*:

```
ACTMON    IP390,OPTION=IP390,INTVL=01:00,STATUS=NORMAL


IPHOST  PKOCH,SP=NMPIPL10,
          OPTION=IP390,
          HOSTNAME=yourhost.yourcompany.com,
          INTVL=45
          FORMAT=SNMP,
          STATUS=(NORMAL,THRESH*,DEGR*),
          MIBVAR1=(tcpActiveOpens.0,LT,5000),
          MIBVAR2=(tcpInErs.0,GT,5),
          MIBVAR3=(lplnDiscards.0,EQ,1),
          MIBVAR4=(ipRoutingDiscards.0,GE,3),
          EXIT15=MYEXIT15
```

Chapter 11. AON Option Definition Tables

AON option definition tables specify programs that perform resource-dependent functions. The option definition tables also provide literals used by the AON operator interface to create menus containing only selections available in your installation. Each AON function has an option definition table. Some functions, such as AON/SNA, have several options, such as subarea, APPN, SNBU, and X25, that can be enabled independently. Option-specific definitions in the tables are found on the EZLOPT entries. Definitions that are resource-specific are on the EZLRT entries in the option definition tables.

How AON Uses Option Definition Tables

AON uses the EZLERTVE routine to access the option definition tables. For resource-specific definitions, the option definition tables include EZLRT entries. When the EZLERTVE routine is called to look up an EZLRT table value, it first looks for the keyword of the resource type. If the keyword does not exist for that resource type, EZLERTVE obtains the OPTION keyword for the resource type and looks up that keyword. If the keyword is not found there, and the option has an OPTION keyword, EZLERTVE continues looking for an entry in the parent definition of the option.

For example, if the EZLERTVE routine is called to find EZLRT CDRM RESINFO, it searches table EZLRT for resource type CDRM and keyword RESINFO. The EZLERTVE routine looks for RESINFO in the EZLRT CDRM parameter. If it is not found, the EZLERTVE routine obtains the OPTION value of SA from the EZLRT CDRM parameter. The EZLERTVE routine looks for RESINFO on the EZLOPT SA parameter. Again, if it is not found, the EZLERTVE routine gets the OPTION value of SNA from the EZLOPT SA parameter. The EZLERTVE routine looks for RESINFO on the EZLOPT SNA parameter. If it is still not found, the EZLERTVE routine returns N/A to the calling routine.

The first time RESINFO is found on any parameter, the value found there is returned to the calling routine and the EZLERTVE routine exits.

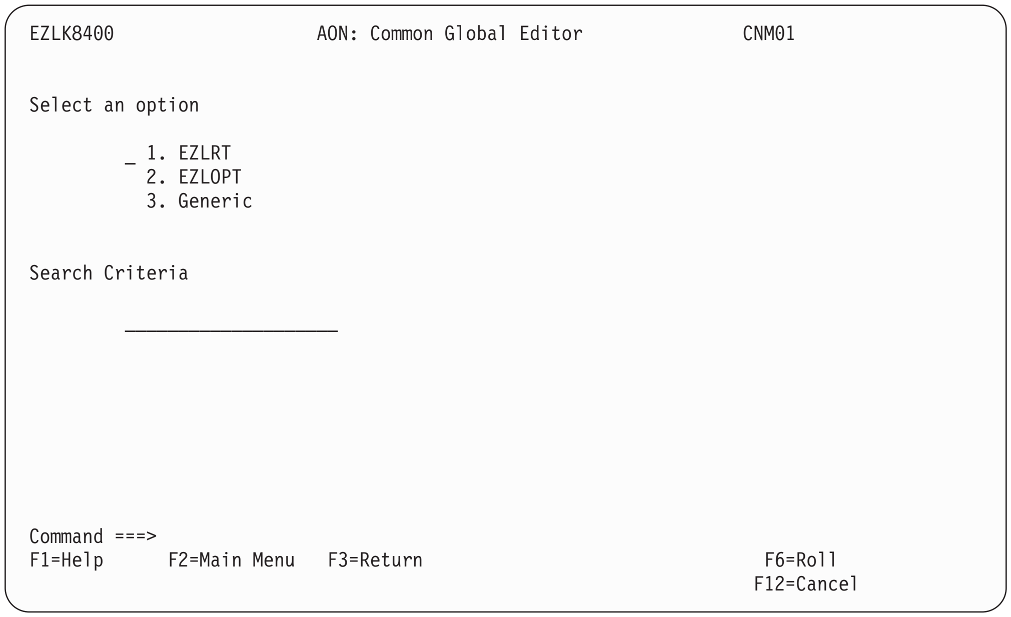
The option definition table uses a tree structure. AON uses the definition found at the lowest level as follows:

```
EZLOPT SNA  →  EZLOPT SA  →  EZLRT CDRM
```

For more information about EZLERTVE, see Chapter 8, “Coding Common Routines,” on page 141.

Displaying or Replacing a Definition

The values in the option definition tables are placed in NetView common global variables for fast access during automation. The common global variable format for resource type values is `EZLRT.resource_type.keyword`. The common global variable format for option values is `EZLOPT.option.keyword`. You can display these common global variables by selecting one of the options on the AON Common Global Editor panel shown in Figure 30 on page 244. To access this panel, type **CGED** and press **Enter**.

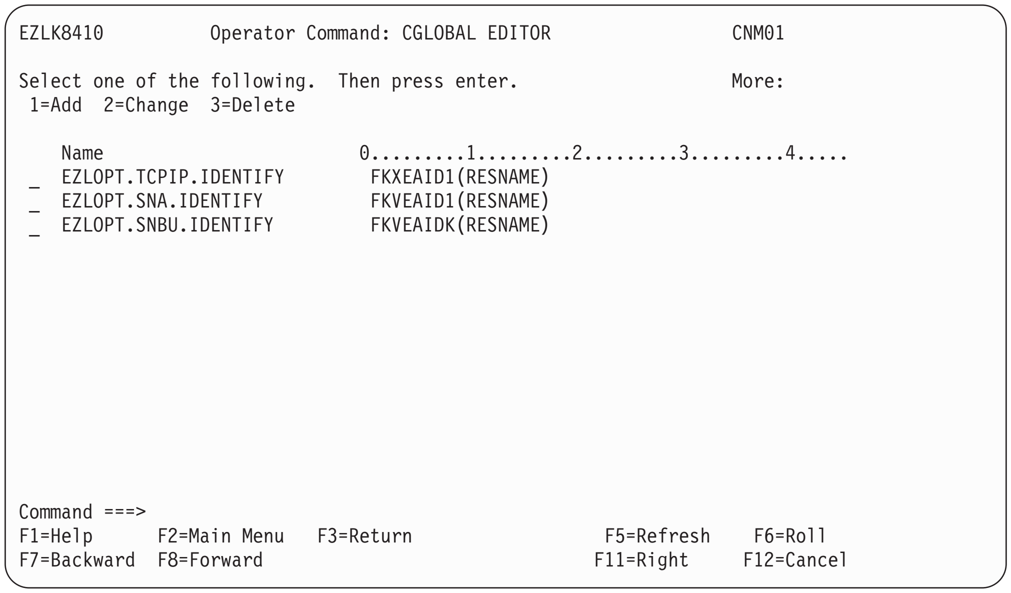


```
EZLK8400                 AON: Common Global Editor              CNM01


Select an option

         _ 1. EZLRT
           2. EZLOPT
           3. Generic


Search Criteria

         ____________________









Command ===>
F1=Help      F2=Main Menu   F3=Return                              F6=Roll
                                                                  F12=Cancel
```

Figure 30. AON Common Global Editor Panel

Table 16. Display selection options

Values to display	What you select
All the resource type values	**1**
All the option values	**2**
User-specified values	**3** and type a search criterion. For example, `EZL*.*.IDENTIFY` lists all of the IDENTIFY routines defined by option or by resource type, as shown in Figure 31.



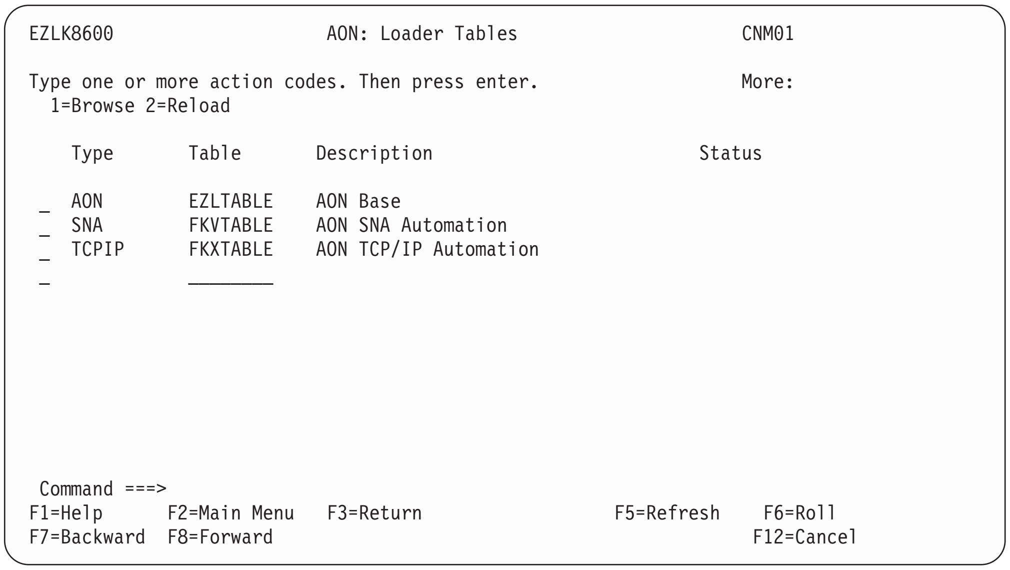
```
EZLK8410         Operator Command: CGLOBAL EDITOR               CNM01

Select one of the following.  Then press enter.                 More:
 1=Add  2=Change  3=Delete

    Name                       0.........1.........2.........3.........4.....
 _  EZLOPT.TCPIP.IDENTIFY       FKXEAID1(RESNAME)
 _  EZLOPT.SNA.IDENTIFY         FKVEAID1(RESNAME)
 _  EZLOPT.SNBU.IDENTIFY        FKVEAIDK(RESNAME)












Command ===>
F1=Help      F2=Main Menu   F3=Return                  F5=Refresh    F6=Roll
F7=Backward  F8=Forward                               F11=Right     F12=Cancel
```

Figure 31. Operator Command: CGLOBAL EDITOR Panel

To change the value of an EZLOPT entry, use the change function on this panel and type over the current value with the new value. The value is changed immediately. It does not change the option definition table. If you reload your option definition table or recycle NetView, the definition reverts to what is defined in the option definition table. If you need permanent changes, update the definition and replace it, as described in the next section, “Displaying or Replacing an Option Definition Table.”

Displaying or Replacing an Option Definition Table

The AON option definition tables are kept in the NetView DSIPARM data set. You can browse or reload one of these tables into the common global variables used by the AON programs by using the AON Loader Tables panel. To display this panel, type the fast path **AON 1.8.6** and press **Enter**. The panel shown in Figure 32 is displayed.



```
EZLK8600                  AON: Loader Tables                     CNM01

Type one or more action codes. Then press enter.                 More:
  1=Browse 2=Reload

    Type       Table      Description                         Status

 _  AON        EZLTABLE   AON Base
 _  SNA        FKVTABLE   AON SNA Automation
 _  TCPIP      FKXTABLE   AON TCP/IP Automation
 _             ________









 Command ===>
F1=Help      F2=Main Menu   F3=Return                 F5=Refresh    F6=Roll
F7=Backward  F8=Forward                                            F12=Cancel
```

Figure 32. AON: Loader Tables Panel

The Loader Tables panel lists the tables that are currently loaded. In Figure 32, option definition tables are installed for the AON base and the SNA Automation and TCP/IP Automation features. The panel also contains a blank table-name entry field where you can type a table name not already listed on the panel. You can use the browse option to display the table in DSIPARM. If you select option 2, the table is retrieved from DSIPARM and the common global variables generated by the table are refreshed from the current table. Refreshing the table places the last load of the table into effect immediately.

Guidelines for Option Definition Table Entries

Follow the guidelines described in this topic to create or modify option definition table entries.

Defining Literals

Quotations are not valid unless the literal consists of more than one token. Semicolons (;) are not valid in literals. For example, `ENABLE=YES` has no semicolon.

Defining Text

Place text inside single quotation marks. Semicolons (;) are not valid. The following is an example:

```
CMD='"RECYCLE" RESNAME'
```

Defining Lists

Enclose lists in parentheses. A list can contain a space or comma delimiter, but cannot contain a semicolon (;) as a delimiter. The following is an example:

```
IST105I=(EZL531,FKVEAIDA(resname restype))
```

In the previous example, the first element in the list is a literal, and the second element is a function call.

Defining Function Calls

Code function calls in the following format:

```
keyword=function_name(parm1 parm2 parmn)
```

Spaces are not valid between the function name and the left parentheses. Enclose the parameter list after the function name in parentheses. An empty parameter list is indicated by (). Quotations are not valid in the program call. Use spaces as delimiters in the parameters in the list. Semicolons are not valid in function calls. If one of the parameters sent to the function is a literal, enclose the literal in double quotation marks, as follows:

```
Keyword=function_name(parm1  "lit2" parmn).
```

The function must return data in *keyword=variable* format or a numeric return code. Use spaces as delimiters in return data. Enclose values containing spaces in double quotation marks or parentheses.

For example, a RESINFO call for PU resolves to that defined for SNA: RESINFO=FKVEAID2(*resname*). If the resource name in the calling program is PU01, the function call resolves to `return_string = FKVEAID2(PU01)`.

In the previous example, the only parameter being sent to function FKVEAID2 is the name of the resource, what the variable *resname* contains in the calling program. The calling program must ensure that *resname* has a value. The returning data from FKVEAID2 is stored in *Return_string*. The *Return_string* would contain a data string such as the following:

```
'RESTYPE=PU HIGHNODE=LINE01 STATUS=INACT RESHIER="NCP01 NCP LINE01 LINE PU01 CTLR"'
```

If the returning data is numeric, it should be a return code.

Defining Command Calls

Command calls in option definition tables are enclosed entirely in single quotation marks. The input parameters should use spaces as delimiters for variable names and double quotation marks for literals. For example:

```
keyword='"program_name "var1 var2 ""lit1" var3'
```

A program should return only numeric return codes to the calling program.

In the next example, the program name is EZLECAUT; *resname* is a variable that takes on whatever value *resname* has in the calling program:

```
CHKAUTO='"EZLECAUT " resname " PU"'
```

PU is being sent as a literal. If the *resname* had the value of PU01, the call is:

```
   EZLECAUT PU01 PU
```

The program returns a return code for analysis by the calling routine. The program can also alter the common global variables or task global variables (TGLOBALs) used by the calling program to influence the processing in the calling program.

Common Global Variable Format

Common global variables are created in the following format:

```
Table_name.Entry.Kwx
```

Error Checking

The table loader stops if it encounters an error. Any common global variables created at that point are defined. AON checks for the following errors:

- Entry = ''.
- There are no keywords.
- There are no closing parentheses.
- Keyword values are uneven.
- A semicolon is missing after an entry.
- Value *x* exceeds the maximum amount of valid data in a common global variable (currently set at 255).
- The *option_definition_table* is not in the DSIPARM data set.
- The member is empty.

Error Return Codes

Error message 218 is issued for errors found by EZLEALDR after the syntax check. The following return codes are issued to help you determine the problem with the table being loaded:

5	Missing entry ID
6	Missing key values
7	Missing key parameters
8	Uneven keyword in key value
9	Missing ending semicolon
10	Missing comma
11	Keyword value entry > 255

Format for Option Definition Table Entries

This topic illustrates the syntax of an option definition table entry and describes the parameters that can be used in option definition table entries.

table_name entry

table_name entry

```
▶▶──table_name entry──,kw1=val1──,kw2=val2──,kwn=valn──────────────────────────▶◀
```

Parameters

table_name
The name of the option definition table.

EZLOPT
The option definition table contains the automation definitions for an entire option or suboption. Define only those keywords that apply. The highest level option does not have an OPTION keyword. The OPTION keyword points to the higher level option of the suboption.

EZLRT
The resource type option definition table contains an entry for every valid resource type under any option or suboption. An OPTION keyword must be defined to identify the option that owns this resource type. There are no current provisions for resource types owned by multiple options.

entry
Option name or resource type under an option.

Option names (EZLOPT) are:

SNA	This option provides automation definitions and programs for AON/SNA network operation and automation. This option is specifically for VTAM.
SA	This suboption of AON/SNA provides automation definitions and programs for subarea SNA networks. Specifically, NCP, LINE, PU, LU, CDRMS, CDRSCs, and APPLs are included.
APPN	This suboption of AON/SNA provides automation definitions and programs for Advanced Peer-to-Peer Networking (APPN) SNA networks. This option is specifically for control points (hosts), end nodes, and network nodes.
SNBU	This suboption of AON/SNA provides automatic dial backup for failed PUs between two SNA subarea nodes.
X25	This suboption of SNA provides active monitoring of X25 components defined in NCP and NCP LUDRPOOL availability.
TCPIP	This option provides drop-in tables for operating and monitoring of TCP/IP networks using simple network management protocol (SNMP) for network management.
IP390	This suboption of TCPIP provides tables for the operation and monitoring of IP resources using z/OS CommServer IP.
NVAIX	This suboption of TCPIP provides tables for operating and monitoring TCP/IP networks managed by a Tivoli NetView for UNIX service point reporting to this IBM Tivoli NetView for z/OS.

Resource type names (EZLRT) are:

APPL	Option SNA; Suboption SA
STG	Option SNA; Suboption SA
CDRM	Option SNA; Suboption SA
CDRSC	Option SNA; Suboption SA
NCP	Option SNA; Suboption SA
LINKSTA	Option SNA; Suboption SA
LINE	Option SNA; Suboption SA
SESSION	Option SNA; Suboption SA
PU	Option SNA; Suboption SA
LU	Option SNA; Suboption SA
CP	Option SNA; Suboption APPN
CPCPSESS	Option SNA; Suboption APPN
SNBUPU	Option SNA; Suboption SNBU
X25MCH	Option SNA; Suboption X25
X25PU	Option SNA; Suboption X25
HOST	Option TCPIP; suboption NVAIX
IPROUTER	Option TCPIP
INFC	Option TCPIP; suboption NVAIX
LINK	Option TCPIP; suboption NVAIX
NAMESERV	Option TCPIP; suboption NVAIX
SERVER	Option TCPIP
SP	Option TCPIP
IPPORT	Option TCPIP; Suboption IP390
> **IPTELNET**	Option TCPIP; Suboption IP390
IPHOST	Option TCPIP; Suboption IP390
IPINFC	Option TCPIP; Suboption IP390
IPNAMESERV	Option TCPIP; Suboption IP390
IPTN3270	Option TCPIP; Suboption IP390
IPCONN	Option TCPIP; Suboption IP390

kw1=val1
Keyword associated with the entry in the table.

Keyword names
Description

ACTMON='*program_call***'**
Called by the EZLERECV routine and AON initialization to actively monitor a network resource for availability. Do not use this routine to call EZLEFAIL when the monitored resource is not in an acceptable state. After calling EZLEFAIL, ACTMON should not reschedule itself because EZLEFAIL starts recovery monitoring and EZLERECV restarts this process when the resource is available again.

If the routine is in a normal status, the program should reschedule itself using the NetView AT or AFTER command.

This program should be called as a program because the results of the processed call and the return code is not checked. This process is particularly important to AON/SNA, APPN, and AON/TCP options.

AUTOVIEW='*program_call***'**
When AutoView is started, the presence of this definition adds the option on the AutoView option panel. If the option with this definition is selected by the user, the program is called to provide the user a custom information screen about the resource managed by that option.

CHKAUTO='*program_call*'
This program is called to discover whether automated recovery, tracking, and notification should be performed for a resource. This program determines whether the resource is to be automated.

For most resources, the RECOVERY statement of the control file is processed to determine the value of the AUTO parameter and whether the current time is within an applicable NOAUTO window. It can also involve commands and other program calls to determine whether this is an automated resource. EZLECAUT is currently being used as a generic routine to check the RECOVERY entry in the control file. This program is called by EZLEFAIL and EZLERECV. Its call can be skipped by defining SKIP=C on the call to EZLEFAIL/EZLERECV.

Call CHKAUTO as a command because the return code is checked. A return code of zero (0) means automation is in effect. A return code of 1 means that automation is not in effect. If this call is made as a function, the receiving alphanumeric data back from the function is treated as a return code of zero (0).

CHKHIGH='*program_call*'
This program is called by EZLEFAIL to check that the higher node for the resource is in a state for which recovery on the resource can occur. The higher node can be in terms of hierarchy, connectivity, network management, or priority. For example, if a Line to a PU is inactive, it is impossible to activate the PU because the physical connection is not present; therefore, the call to CHKHIGH should return a 1 (do not continue processing). This is an example of a connectivity higher node.

CHKTHR='*program_call*'
This program is called by EZLEFAIL to determine whether threshold has been exceeded. The recommended action for this program is to check the control file THRESHOLDS setting for the resource and analyze the status file error log to determine whether threshold setting has been exceeded. This call in EZLEFAIL can be skipped by coding SKIP=(T) on the EZLEFAIL invocation.

Set return codes to:

- RC=0 No threshold has been exceeded.
- RC=1 Infrequent threshold has been exceeded.
- RC=2 Frequent threshold has been exceeded.
- RC=3 Critical threshold has been exceeded.

CRITACT='*prog/func_call*'
This program is called when a critical threshold (RC=3 from the CHKTHR command call) has been exceeded in EZLEFAIL. Its purpose is to take action when a critical threshold is exceeded. If processing in the program should not continue, a nonzero return code should be returned. If data is returned from a function call, the return code is treated as if it were zero(0), action that should occur when a critical threshold has been exceeded. In the SA option, a critical threshold exception for a PU causes the PU to be deactivated.

ENABLE=Y|N
The enable flag indicates whether an installed function should be enabled. The flag is checked in EZLEFAIL and EZLERECV. Those programs exit if the ENABLE parameter is set to no (ENABLE=N) for the option. This flag is not valid at the EZLRT table level.

FREQACT='*prog/func_call***'**
: This program is called when a frequent threshold (RC=3 from the CHKTHR command call) has been exceeded in EZLEFAIL. Its purpose is to take action when a frequent threshold is exceeded. If processing in the program should not continue, a nonzero return code is returned. If data is returned from a function call, the return code is treated as if it were zero (0). Issue actions that should occur when a frequent threshold has been exceeded

HELPDESK='*program_call***'**
: The presence of this definition adds the option into the AON help desk menu panel (EZLK1000). If the option is selected, this program is called to provide a help desk problem determination function for the operator.

IDENTIFY='*prog/func_call***'**
: This program is called at the beginning of EZLEFAIL and EZLERECV to determine which option a resource belongs to and what its resource type is. The only parameter that the IDENTIFY program should require is the resource name. The IDENTIFY program should be able to determine whether the resource belongs to this option (where the IDENTIFY program is coded) and what the resource type is. If the resource type is to be returned, the IDENTIFY program should be a function call returning RESTYPE=*restype*. The return code is assumed to be zero and processing continues. If the return code is not zero, the resource is not managed by this option, and the calling program must try another option or discontinue processing.

INFRACT='*prog/func_call***'**
: This program is called when an infrequent threshold (RC=3 from the CHKTHR command call) has been exceeded in EZLEFAIL. Its purpose is to take action when an infrequent threshold has been exceeded. If processing in the program should not continue, a nonzero return code should be returned. If data is returned from a function call, then the return code is treated as if it were zero (0). Issue the action that should occur when an infrequent threshold has been exceeded from this program.

MAINPANELPOS=*selection_number_on_AON_panel*
: This literal is used to format the main operator interface panel. This literal specifies where, in the list of installed options, this selection is displayed. This keyword is used by the 3270 operator interface only and is only valid in the EZLOPT table.

MESSAGING='*prog/func_call***'**
: This program is called when operator messaging, logging, and DDF updates are done. It is called from EZLEASLN. You can set special variables for messaging, resource types can be initialized, special processing for updating a particular option, suboption, or resource type can be done.

MSGCLASS=(*msgclass_number,...***)**
: MSGCLASS is a 2-digit number used to assign AON notifications to notification operators (as assigned on the NTFYOPS control file entry). Notification operators use this *msgclass_number* in their CLASS list (on the NTFYOPS control file entry) to receive the message. A message accumulates message classes from the EZLRT MSGCLASS= table entry, EZLOPT MSGCLASS entry for the suboption and option, and the call to search *ppp*MT*xx* (*xx* is the first two digits of the message number

and *ppp* is the message prefix, *pppxxns*). If an entry in this DSIPARM member has this message ID starting in column one, the MSGCLASS defined for it is added to the MSGCLASS list.

OCMDCMD=*program_name*
: Use this command call to issue the 3270 operator interface for an option or suboption. This keyword is used by the 3270 operator interface only and is only valid in the EZLOPT table.

OCMDDESC='*literal_for_panel_id***'**
: This literal is displayed on the main panel of the AON operator interface menu (EZLR0000) to describe the installed options and suboptions. This keyword is used by the 3270 operator interface only and is only valid in the EZLOPT table.

OPERLIST=*(operglob1 operglob2 operglob3 ... operglobn)*
: Use OPERLIST when allocating work to automation operators to enable multithreading of the automation work load. If the automation operator is not active when a command is routed to an automation operator, it is routed to the next automation operator in the list. If a command is routed to *operglob2*, it is shipped to the operator ID stored the common global variable, *operglob2*. Operator IDs are defined in the AUTOOPS entries in the control file. Refer to the *IBM Tivoli NetView for z/OS Administration Reference* for more information. If operator2 (from *oprglob2*) is inactive, the command is routed to *operglob3*. The routine continues until an active automation operator is found to issue the command or *operglobn* is reached.

OPTION=*immediate_superoption_owning_the_suboption_or_resource_type*
: This literal should reflect the immediate owner of this option or resource type. For a suboption, it reflects the option with which it is shipped (as specified in its EZLOPT definition). For a resource type, the literal reflects the option or suboption that is responsible for managing the resource type that is specified in its EZLOPT definition.

  For example, the SNA option ships with the following table definitions for its options and suboptions:

```
EZLOPT AON,ENABLE=Y,...
EZLOPT SNA,OPTION=AON,ENABLE=Y,...
      ...
EZLOPT SA,OPTION=SNA,ENABLE=Y,...
EZLRT NCP,OPTION=SA,...
EZLRT PU,OPTION=SA,...
      ...
EZLOPT APPN,OPTION=SNA,ENABLE=Y,...
EZLRT CP,OPTION=APPN,...
      ...
EZLOPT SNBU,OPTION=SNA,ENABLE=Y,...
EZLRT MODEM,OPTION=SNBU,...
      ...
```

  The AON option does not have an OPTION parameter because it is the highest level in the EZLOPT table for this grouping.

  This keyword is required on every entry except the highest option level.

RECOVMON='*program_call***'**
: This program is called by EZLEFAIL as the last action before notifying operations of the failure. RECOVMON date and time entries are given

in GMTDATE and GMTTIME parameters. This command call can be skipped by coding SKIP=(R) on the EZLEFAIL call. Recommended actions for this program are:

1. Check the automation flag to ensure automation has not been turned off for this resource since the last execution of this program.
2. Check the status of the resource to ensure it is still not in an acceptable status (it might have recovered since the last execution of this program).
3. Take action to return the resource to an acceptable status.
4. Post an availability message to the logs.
5. If recovery was not successful, notify operators that the resource is still inactive. If recovery was successful, write a message to the log saying that recovery was successful.
6. Reschedule this program to run on a user-defined interval, typically, the control file MONIT intervals, although some options might choose to use a constant interval. Customers can define the interval without modifying the program.

This should be a command call because the return string and return codes are not checked. It is an asynchronous monitoring process.

REPORTER=*variable_name*
REPORTER is a variable that completes the Reported By field used by AON and some AON function messages. The default variable used is DOMAINID. AON/TCP uses SP.

RESINFO='*function_call***'**
The program returns all information required by the calling program about a resource. The only parameters required should be the resource name and perhaps the resource type (if known). A function call passes back data. The return string should be in the "*varname=varvalue...*" format. The calling program assigns the variables when processing the return string.

RESLIST='*program_call***'**
The operator interface calls this program to create a select list of resources of a particular type or for an option (depending on where in the tables it is coded). This keyword is used by the 3270 operator interface only and is only valid in the EZLOPT table.

STSCMD=*program_name*
This is the name of the command processor used by an option to update the AON VSAM status file.

STSPIPE=*program_name*
This is the name of the command processor used by an option to update the AON VSAM status file (PIPE version).

SUMCMD=*program_name*
This is the program name called by the operator interface to create a resource information summary panel for a resource type or option. This keyword is used by the 3270 operator interface only and is only valid in the EZLOPT table.

tblkey_value
The value on the TBLKEY= keyword specifies optional processing values used by the EZLEFAIL or EZLERECV routine. If you do not specify the TBLKEY parameter for the EZLEFAIL or EZLERECV

routine, no optional processing or notification occurs. The values on the TBLKEY parameter specify keywords found in the option definition tables. In the option definition table, the keywords define the actual processing values used for optional processing. AON saves the TBLKEY values in the *outmsgid* and *spec_function* variables. Message EZL509I is the default *outmsgid* for EZLEFAIL. EZL504I is the default *outmsgid* for EZLERECV. The value of TBLKEY is in the following format:

```
tblkey_value=(outmsgid,spec_function_call)
```

For example, the EZLEFAIL routine can be called with:

```
EZLEFAIL OPTION=SA MSGPRMS=(OPID) TBLKEY=IST105I
        RESNAME=resname
```

The EZLEFAIL routine obtains the values specified on the IST105I keyword in the option definition table, for example:

```
IST105I=(EZL531,FKVEAIDA(resname restype))
```

In the previous example, the EZLEFAIL routine issues the EZL531I message and runs FKVEAIDA as a function sending the current value of *resname* (resource name) and *restype* (resource type) for optional processing. An optional processing program would perform any automation or processing unique to the resource or failure. No optional processing is done and no message is issued if SKIP=(0) is specified on the EZLEFAIL or EZLERECV call.

The EZLEFAIL routine issues message EZL509I or EZL510I to all logs and to DDF. The EZLERECV routine issues EZL504I to all logs and to DDF. Operators do not receive this message. This message is not issued if SKIP=(A) is specified on the EZLEFAIL or EZLERECV call.

Usage

Sequence numbers in option definition tables can cause unpredictable results.

Part 4. Appendixes

Appendix A. VTAM Messages

This chapter explains the purpose of the VTAM messages that AON/SNA uses, shows the operator response, and any special processing.

General Resource VTAM Messages

IST093I *resource_name* **ACTIVE**

IST1132I *resource_name* **IS ACTIVE, TYPE=***resource_type*

Problem determination: Indicates when a resource becomes active. AON/SNA posts the resource as available.

Operator response: EZL504I : *resource_type resource_name* IS AVAILABLE

EZL517I : *resource_type resource_name* HAS BECOME ACTIVE FROM INTERVENTION BY OPERATOR *operator_id*

Explanation:

If the operator that recovered the resource is an AON/SNA automation operator, suppress the EZL517I operator notification because the IST093I was issued as a result of automation activity.

Clear the threshold settings from the status file in preparation for the next failure.

If recovery is in effect, the status of the resource is not CONCT, and the resource type is a PU, LINE, or LINKSTA, check to see if this is part of a two-line TG with lines of unequal speeds and switch traffic flow to the faster (primary) line and relegate the slower line to a back up function in case the faster line fails. This is defined by the TGSWITCH control file definitions.

IST105I *resource_name* **NODE NOW INACTIVE**

IST1133I *resource_name* **IS NOW INACTIVE, TYPE=***resource_type*

Problem determination: If VTAM issues IST105I as a result of an operator (OST) command, AON/SNA posts status and stops automated recovery. This enables the operator to work with a resource without AON intervention. The operator is now responsible for recovery of the resource. If VTAM issues the message as unsolicited, AON/SNA initiates standard EZLEFAIL recovery.

Operator response: EZL505I : RECOVERY TERMINATED FOR *resource_type resource_name* DUE TO ACTION BY OPERATOR *operator_id*

EZL509I : *resource_type resource_ name* IS UNAVAILABLE

EZL531I : *resource_type resource_ name* IS INACTIVE DUE TO OPERATOR *operator_id* INTERVENTION

Explanation: If an AON/SNA automation operator issues the INACT command, ignore the message because it is part of a recovery attempt.

If an operator issues the INACT command, stop recovery and issue the EZL531I.

If a timer already exists for recovery monitoring, purge the timer and start recovery monitoring again.

If the automation status is INRCVY REMIND or REACTV, issue the EZL505I message to all operators.

IST129I **UNRECOVERABLE OR FORCED ERROR ON NODE** *resource_name* **- VARY INACT SCHED**

IST1135I **FORCED VARY INACT SCHEDULED FOR** *resource_name*

IST1136I **VARY INACT** *resource_name* **SCHEDULED - UNRECOVERABLE ERROR**

Problem determination: Detects if resource is in a state that AON/SNA cannot recover it from. Stop automation and notify operators that intervention might be required.

Operator response: FKV526I : *resource_type resource_ name* IS IN AN INVALID STATE: CURRENT STATUS IS *resource_status*

Explanation: Thresholding, availability, messaging, and recovery are not performed by the EZLEFAIL program.

Stops recovery attempts and messaging if the resource is in an unrecoverable state: not ACT* CON* INA* or IIN*.

IST383I **DEACTIVATION OF ID =** *resource_name* **FAILED - REQUEST:** *rcmd* **SENSE :** *rsense***.**

IST1268I *resource_name* **DEACTIVATION** *rcmd* **FAILED :** *rsense*

Problem determination:

Detects failed resource deactivations. AON/SNA initiates recovery for the resource with the EZLEFAIL program.

Operator response: EZL509I : *resource_type resource_name* IS UNAVAILABLE

FKV527I : DEACTIVATION OF *resource_name* CANNOT BE COMPLETED BECAUSE *resource_name* HAS FAILED WITH SENSE: *rsense*

Explanation: None

IST608I **VARY ACT FOR ID =** *minor_resource_name* **FAILED-HIGHER NODE :** *resource_name*

IST1274I **VARY ACT** *minor_resource_name* **FAILED =** *resource_name* **NOT ACTIVE**

Problem determination: Detect when AON/SNA cannot recover a resource because its higher node is not active. AON initiates recovery for the higher node and the lower node with the EZLEFAIL program.

Operator response: FKV529I : ACTIVATION OF *minor_resource_name* FAILED DUE TO INACTIVE HIGHER NODE - *resource_name*. ACTIVATION OF *resource_name* IS ATTEMPTED

EZL509I : *resource_type resource_name* IS UNAVAILABLE

Explanation: Thresholding is not performed for the resource.

IST619I **ID=***resource_name* **FAILED- RECOVERY IN PROGRESS**

IST1416I **ID=***resource_name* **FAILED- RECOVERY IN PROGRESS**

Problem determination: Detects a resource failure that VTAM is attempting to recover. AON/SNA enables VTAM MONIT interval to recover the resource. If VTAM is unsuccessful, AON/SNA initiates recovery.

Operator response: EZL509I : *resource_type resource_name* IS UNAVAILABLE

Explanation: Thresholding and recovery is performed after the MONIT interval delay.

IST621I **RECOVERY SUCCESSFUL FOR NETWORK NODE** *resource_name*

Problem determination: Detects successful VTAM recovery of a resource. Posts active resource status and discontinues AON/SNA recovery efforts.

Operator response: EZL504I : *resource_type resource_name* IS AVAILABLE

Explanation: Clear the status file THRSHLD setting if it is CRIT.

If RECOVERY flags are on for the resource (call EZLECAUT), the resource status is not CON* or REC*, and the resource type is a PU, LINE, or LINKSTA, check to see if the resource is one of a two line TG with lines of unequal speeds. Manage the line so that the faster line (the primary line) is carrying all the traffic and relegate the slower line to a back up function in case the faster line fails. This is defined by the control file TGSWITCH definitions.

CDRM VTAM Messages

IST727I **COMMUNICATION WITH CDRM** *resource_name* **LOST - REASON=X'cause code'.**

Problem determination: Detects and notifies operators of a CDRM failure. AON/SNA tries to recover CDRM failures with the EZLEFAIL program.

Operator response: FKV520I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO FORCED INACTIVATE OF THE VR (RC = *rc*); AUTOMATIC RECOVERY IN PROGRESS

FKV521I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO VR INOP (RC = *cause_code.*); AUTOMATIC RECOVER IN PROGRESS

FKV522I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO SSCP - FAILURE (RC = *rc*); AUTOMATIC RECOVERY IN PROGRESS

FKV525I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO SESSION OVERRIDE - ACTIVATE ALREADY IN PROGRESS (RC = *cause_code.*)

FKV511I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO SSCP FAILURE - (RC=*rc*); AUTOMATIC RECOVERY IN PROGRESS

FKV517I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO CLEANUP - THE SSCP IS RESETTING (RC = *cause_code*)

FKV519I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO SSCP CONTENTION (RC = *cause_code*)

FKV531I : COMMUNICATION WITH CDRM *resource_name* LOST DUE TO GATEWAY NODE CLEANUP (RC = *cause_code*)

Explanation: EZL504I is not issued for the CDRM by the EZLEFAIL program.

IST742I ACTIVATION OF CDRM *resource_name* **FAILED GWN PATH NOT AVAILABLE**

Problem determination: Detects and notifies operators of a CDRM failure. AON/SNA initiates CDRM recovery with the EZLEFAIL program.

Operator response: FKV541I : ACTIVATION FAILED FOR CDRM *resource_name*; GATEWAY PATH NOT AVAILABLE

IST742I ACTIVATION OF CDRM *resource_name* **QUEUED GWN PATH NOT AVAILABLE**

Problem determination: Detects and notifies operators of CDRM queuing.

Operator response: FKV541I : ACTIVATION queued FOR CDRM *resource_name*; GATEWAY PATH NOT AVAILABLE

Explanation: Thresholding and recovery not run by the EZLEFAIL program.

Application Messages

IST400I TERMINATION IN PROGRESS FOR APPLID *resource_name*

Problem determination: Detects and notifies operators that the application stopped.

Operator response: FKV552I : APPLICATION *resource_name* HAS BEEN TERMINATED BY VTAM

Explanation: Availability messaging thresholding and recovery are not run by the EZLEFAIL program.

IST804I VTAM CLOSE IN PROGRESS FOR *applname* **OPENED BY** *jobname*

Problem determination: Detects a VTAM ACB close has started. AON/SNA monitors the process to be sure that the close is successful. IST805I is issued. This prevents ACBs from being in an endless loop.

Operator response: EZL550I : APPLICATION *appl* WAS NOT CLOSED CORRECTLY BY *operator_id*

Explanation: EZLEFAIL processing for availability messages, thresholding, messaging, and recovery is not done.

Check the control file recovery flag for JOBNAME. If recovery is off for it then exit.

Start timers for NOTIFY and CHECK intervals. When running on CHECK intervals (defined in the control file RECOVERY flag for APPLs) then the status of the application is checked but if it is down, operators are not notified. If it is up, recovery processing is done. When running on NOTIFY intervals, operators are notified if the application is still unavailable.

After two minutes, issue the EZL550 message. This is to give VTAM a chance to stop the application correctly before notifying operators. If it stops correctly, IST805I processing purges this timer and the operators are not notified.

IST805I VTAM CLOSE COMPLETE FOR *applname*

Problem determination: The VTAM close is complete for the ACB. AON/SNA stops monitoring for successful close.

Explanation:

Only optional processing is performed by the EZLEFAIL program. Purge the timer set from IST804I to issue a message to the operator that the application has not stopped normally.

Host VTAM Messages

IST348I UNABLE TO PROCESS DISCONNECTION FOR PU = *resource_name* **DUE TO LACK OF STORAGE**

Problem determination: Notify operators of storage shortage problems during disconnection of a PU.

Operator response:

EZL509I : *resource_type resource_name* IS UNAVAILABLE

FKV518I : *resource_type resource_name* DISCONNECTION FAILED DUE TO LACK OF STORAGE - STATUS IS resource_status

Explanation: 'D NET,BFRUSE'

Thresholding is not performed by the EZLEFAIL program.

IST561I STORAGE UNAVAILABLE: *pool* **BUFFER POOL**

Problem determination: Detects and notifies operators of storage shortage problems.

Operator response:

FKV514I : STORAGE UNAVAILABLE FOR *resource_name* BUFFER POOL

Explanation: 'D NET,BFRUSE'

The EZLEFAIL program performs only optional processing and messaging.

IST562I STORAGE UNAVAILABLE: *pool* **REACHED**

Problem determination: Detects and notifies operators of storage shortage problems in CSA.

Operator response: FKV515I : STORAGE UNAVAILABLE - *resource_name* HAS BEEN REACHED

Explanation: 'D NET,BFRUSE'

The EZLEFAIL program performs only optional processing and messaging.

IST564I STORAGE UNAVAILABLE COMMON AREA SUBPOOL *pool*

Problem determination: Detects and notifies operators of storage shortage problems in CSA.

Operator response: FKV516I : STORAGE UNAVAILABLE FOR SUBPOOL *resource_name*

Explanation: 'D NET,BFRUSE'

The EZLEFAIL program performs only optional processing and messaging.

IST693I UNABLE TO DISCONNECT ID = *resource_name*

Problem determination: Detects disconnection failure. AON/SNA initiates recovery with the EZLEFAIL program.

Operator response: EZL509I : *resource_type resource_name* IS UNAVAILABLE

FKV528I : DISCONNECT OF *resource_name* FAILED DUE TO I/O ERROR OR INSUFFICIENT STORAGE

Explanation: 'D NET,BFRUSE'

IST706I ADJSSCP TABLE FOR *resource_name* **IGNORED - INSUFFICIENT STORAGE**

Problem determination: Detects and notifies operators of a storage shortage problem.

Operator response: FKV513I : STORAGE UNAVAILABLE FOR ADJSSCP TABLE FOR *resource_name*

Explanation: 'D NET,BFRUSE'

The EZLEFAIL program performs only optional processing and messaging.

NCP VTAM Messages

IST095A *replyid* **OPTION TO DUMP** *resource_name* **AVAILABLE - REPLY 'YES' or 'NO' or 'YES,DUMPSTA=LINKSTANAME'**

Problem determination: Detects NCP option to dump WTOR. AON responds to the WTOR according to the NCPRECOV definitions. EXIT01 is used. A timer is set to ensure that the dump does not take longer than the time specified in the DUMPTIME parameter. The EZLEFAIL program is not used.

Operator response: EZL509I : *resource_type resource_name* IS UNAVAILABLE

FKV538I : REPLY OF *reply* WAS ISSUED BY AUTOMATION FOR *ncpname* FROM *host*: CRITICAL RELOAD REPLY FROM NON-RECOVERY HOST

FKV535I : REPLY OF *reply* WAS ISSUED BY AUTOMATION FOR *ncpname* FROM *host*: NON-CRITICAL RELOAD REPLY FROM NON-RECOVERY HOST

EZL227E : *ident* COULD NOT FIND EXPECTED CONFIGURATION DATA FROM NCPRECOV COMMAND : *errmsg*

IST260I *resource_name* **-** *sscpname* **SESSION LOST SA** *saname* **CODE** *code***.**

Explanation: The EZLEFAIL program is called. Notifies operators of a host to NCP session loss.

Operator response: FKV524I : SESSION LOST BETWEEN *resource_name* AND *sscp_name* IN SA *sa*

FKV539I : SESSION LOST BETWEEN *resource_name* AND reply IN SA *sa* DUE TO A FORCED DEACTIVATION OF THE SSCP-PU SESSION

FKV543I : SESSION LOST BETWEEN *resource_name* AND *resource_name*2 DUE TO DEACTIVATION OF THE VIRTUAL ROUTE

FKV545I : SESSION LOST BETWEEN *resource_name* AND *resource_name*2 IN SA *sa* DUE TO AN SSCP FAILURE

Explanation: The EZLEFAIL program only runs messaging.

IST270I LOAD OF *resource_name* **COMPLETE-LOAD MODULE** *mod_name*

Problem determination: Finishes NCP recovery by indicating that the load of the NCP is complete. AON/SNA issues EXIT04. The timer for LOADTIME is purged because the load of the NCP is now complete. The EZLEFAIL program is not used.

Operator response: FKV544I : RELOAD WAS SUCCESSFUL FOR *resource_name* AND IS AVAILABLE

IST272A *replyid* **NO INITIAL TEST FOR** *resource_name* **REPLY 'U' TO BYPASS - OR CANCEL**

Problem determination: Responds to the bypass initial load WTOR for the NCP. Replies U. AON/SNA uses the EZLEFAIL program to run.

Operator response: EZL509I : *resource_type resource_name* IS UNAVAILABLE

FKV530I : BYPASS THE INITIAL TEST ROUTINE FOR *resource_name* - REPLY "U" TO BYPASS WAS ISSUED

FKV551I : REPLY FOR BYPASS INITIAL TEST FOR NCP *resource_name* NOT ISSUED; AUTOMATION FOR *resource_name* IS OFF: REPLY 'U' TO BYPASS OR CANCEL FOR REPLY ID reply

Explanation: AON/SNA runs only special processing in the EZLEFAIL program to respond to the outstanding reply.

IST278A *replyid* **'INVALID' REPLY FOR 'ID ='** *resource_name* **LOAD - ENTER 'U' - OR CANCEL**

Problem determination: Responds to a bad reply to IST272A. Replies U.

Operator response: EZL509I : *resource_type resource_name* IS UNAVAILABLE

FKV530I : BYPASS THE INITIAL TEST ROUTINE FOR *resource_name* - REPLY "U" TO BYPASS WAS ISSUED

FKV551I : REPLY FOR BYPASS INITIAL TEST FOR NCP *resource_name* NOT ISSUED; AUTOMATION FOR *resource_name* IS OFF: REPLY 'U' TO BYPASS OR CANCEL FOR REPLY ID *reply*

Explanation: AON/SNA runs only special processing in the EZLEFAIL program to respond to the outstanding reply.

IST284A *replyid* **OPTION TO RELOAD** *resource_name* **AVAILABLE - REPLY 'YES' OR 'NO' OR 'YES,LOADSTA=LINKSTANAME'**

Problem determination: Responds to the option to reload NCP WTOR according to the NCPRECOV definitions. AON/SNA uses EXIT03 and sets a timer to ensure that the time taken to reload the NCP does not exceed LOADTIME. The EZLEFAIL program is not used.

Operator response: FZL227E : *ident* COULD NOT FIND EXPECTED CONFIGURATION DATA FROM NCPRECOV COMMAND : *errmsg*

FKV551I : REPLY FOR BYPASS INITIAL TEST FOR NCP *resource_name* NOT ISSUED; AUTOMATION IS OFF: REPLY 'U' TO BYPASS OR CANCEL FOR REPLYID *replyid*

FKV537I : REPLY OF reply WAS ISSUED BY AUTOMATION FOR *resource_name* FROM *host*: NON-CRITICAL RELOAD REPLY FROM RECOVERY HOST

FKV538I : REPLY OF reply WAS ISSUED BY AUTOMATION FOR *resource_name* FROM *host*: CRITICAL RELOAD REPLY FROM RECOVERY HOST

IST285I *dumptype* **DUMP OF** *resource_name* **FAILED - PERMANENT**

IST285I *dumptype* **DUMP OF** *resource_name* **FAILED - ddname CANNOT**

IST285I *dumptype* **DUMP OF** *resource_name* **FAILED - UNSUPPORTED**

IST285I *dumptype* **DUMP OF** *resource_name* **FAILED - COMPLETE**

Problem determination: AON/SNA checks the progress of the NCP dump. EXIT02 is run if the dump is complete. If the dump failed, notify the operators that the dump of the NCP cannot complete. AON/SNA purges the timer set for DUMPTIME. The EZLEFAIL program is not called when the dump is COMPLETE. The other three variations of IST285I calls IST285I.

Operator response: EZL504I *resource_type resource_name* IS AVAILABLE

FKV550I DUMP OF NCP *resource_name* FAILED - PERMANENT IO ERROR ON NCP OR DUMP DATASET

FKV554I DUMP OF NCP *resource_name* FAILED - DUMP DATASET ddname CANNOT BE OPENED

FKV559I DUMP OF NCP *resource_name* FAILED - DUMP DATASET ON AN UNSUPPORTED DEVICE TYPE

FKV558I DUMP of *resource_name* COMPLETE

Explanation: Thresholding and recovery are not run in the EZLEFAIL program.

IST361A *replyid resource_name* **FOUND LOADED WITH** *loadmod* **REPLY 'YES' TO RELOAD OR 'NO' TO CANCEL ACTIVATION**

Problem determination: Notify operators when the NCP load module does not match the currently loaded module. AON/SNA replies NO if the NCP is to be automatically recovered.

Operator response: EZL509I *resource_type resource_name* IS UNAVAILABLE

FKV510I LOAD OF NCP *resource_name* STOPPED BECAUSE LOAD MODULE DOES NOT MATCH NEW NCP; AUTOMATION IS OFF, REPLY 'NO' TO CANCEL OR 'YES' TO RELOAD FOR REPLYID *replyid*

FKV512I : LOAD OF NCP *resource_name* CANCELLED - LOAD MODULE DOES NOT MATCH NEW NCP

Explanation: The EZLEFAIL program runs the only optional processing.

IST380I **ERROR FOR ID =** *resource_name* **FAILED - REQUEST :** *rcmd***SENSE :** *rsense*

IST1139I *rcmd* **FOR** *resource_name* **FAILED - SENSE:** *rsense*

Problem determination: If *rcmd* is REQDUMP, AON/SNA purges the dump time timer. If *rcmd* is REQLOAD, AON/SNA purges the load time timer. Notification operators are notified that the LOAD/DUMP has failed. The EZLEFAIL program is not used.

Operator response: FKV501I DUMP OF NCP FAILED - *action reason*

FKV502I LOAD OF NCP FAILED - *action reason*

Explanation: None.

IST464I **LINK STATION** *resource_name1* **has CONTACTED** *resource_name2* **SA** *subarea*

Problem determination: Detects a link station connection to the NCP from AON/SNA. AON/SNA posts link station and NCP as available if the NCP is an automated NCP with a NCPRECOV statement. DUMP and LOAD timers are purged. The EZLEFAIL program is not used.

Operator response: EZL504I *resource_type resource_name* IS AVAILABLE

FKV548I *resource_name* HAS CONTACTED *resource_type resource_name* - *resource_name* IS AVAILABLE

IST530I *ru* **PENDING FROM** *resource* **TO** *resource* **FOR** *resource_name*

IST1278I *ru* **PENDING FROM** *netid* **to** *netid* **FOR** *resource_name*

Problem determination: Detects an NCP unavailability from a channel attached non-recovery host. If the NCP status indicates that it is being recovered by another host, AON/SNA enacts/acts the NCP to recover connection to this host. Otherwise, the operator AON/SNA notifies the operator, who manually recovers the NCP. The EZLEFAIL program is not used.

Operator response: EZL504I : *resource_type resource_name* IS AVAILABLE

FKV542I : NCP *ncpname* REQUIRES A MANUAL ACTIVATION

IST881I **UNABLE TO CONTACT LINK STATION** *resource_name*

IST881I **LOST CONTACT TO LINK STATION** *resource_name*

Problem determination: The NCP name is retrieved from the NCPRECOV control file entry link station *resource_name*.

This message detects and reminds operators that the link station is not in contact with the NCP. Stops DUMP/LOAD completion monitoring. The EZLEFAIL program is not used.

Operator response: EZL509I *restype resource_name* is UNAVAILABLE - *ncp_name* MAY NOT BE AVAILABLE

EZL555I : LINK STATION *linksta* HAS LOST CONTACT WITH NCP *ncp_name*

Explanation: None.

IST897I **NONDISRUPTIVE LOAD OF** *resource_name* **WITH** *module_name* **STARTED**

Problem determination: Detects that the load of an NCP has started. The EZLEFAIL program is not used.

Operator response: FKV556I LOAD OF *ncpname* BY OPERATOR *operator_id* STARTED

IST961I **NONDISRUPTIVE LOAD OF** *ncpname* **WITH** *module_name* **FAILED**

IST523I **REASON =** *reason_text*

Problem determination: Detects when the load of an NCP failed. The EZLEFAIL program is called from another program which parses and passes the second IST523I message of the MLWTO.

Operator response: FKV560I LOAD OF *ncp_resource_name* FAILED - RECEIVE *.reason_text*

Explanation: Thresholding and recovery are not run by the EZLEFAIL program.

Appendix B. Sample AON/SNA SNBU Modem Configurations

This section illustrates sample modem configurations to help you code appropriate entries in the control file and select appropriate modem options. The examples provided here are not the only modem options available. Check these modems with the modems listed in the manual for that particular model of IBM modem. Table 17 identifies resources used in all of the following sample configurations.

Note: Ensure that the coupler is installed in the modem and that the phone cable is plugged into the modem.

Table 17. Resource Configuration Key

Resource	**Notes**
TA1L2005	Port on 37*xx* defined as tailed circuit
TA1L2006	Port on 37*xx* defined as multipoint link
TA1L2007	Port on 37*xx* defined as point-to-point link
7861-047	Local modem
5866-2	Local modem
Phone line	Multipoint nonswitched line
Phone line	Point-to-point nonswitched line
Tailing cable	Attached to modem R3
7861-047	Remote modem
5866-2	Remote modem
5866-2	Remote modem
TA1P26A	IBM 3*x*74 control unit (ADDR=C1)
TA1P27A	IBM 3*x*74 control unit (ADDR=C2)
6431	Public telephone line for SNBU (remote)
6432	Public telephone line for SNBU (remote)

Point-to-Point Sample Configuration—Same Modem

The following diagram shows a point-to-point sample configuration using the same modem.

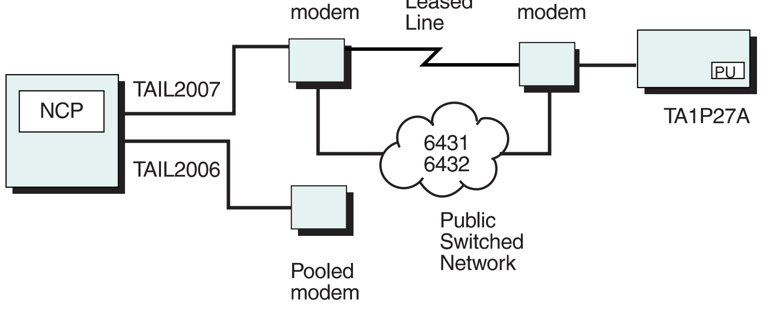


Figure 33. Point-to-Point Sample Configuration—Same Modem

Table 18. Modem Configuration for Point-to-Point—Same Modem

Function	Local Modem	Remote Modem
Address	01	C2
Speed	9600	9600
LPDA2	ENABLED	ENABLED
Feature	FIFO	FIFO
Control	PTP P	PTP P
XMIT clock	INT	RCV

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),RECONN=Y
```

Point-to-Point—Modem Pool

The following diagram shows a point-to-point modem pool.

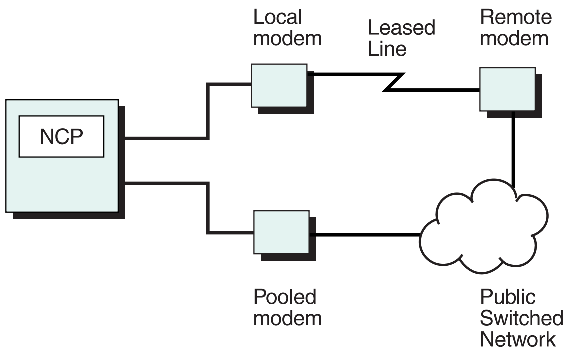


Figure 34. Point-to-Point—Modem Pool

Table 19. Modem Configuration for Point-to-Point—Modem Pool

Function	Local modem	Pooled modem	Remote modem
Address	01	01	C2
Speed	9600	9600	9600
LPDA2	ENABLED	ENABLED	ENABLED
Feature	FIFO	—	FIFO
Control	PTP P	PTP P	PTP P
XMIT clock	INT	INT	RCV

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),POOL=PU2,RECONN=Y
SNBUPOOL PU2
PU2 TA1L2006
```

Note: With this entry, AON/SNA SNBU first attempts to use the same SNBU modem first. The modem pool is used only if the same AON/SNA SNBU modem fails. Specify APO=Y (Alternate Port Only) on the AON/SNA SNBU control file entry to force the use of the modem pool only.

Multipoint Sample Configuration—Modem Pool

The following diagram shows a multipoint sample configuration modem pool.

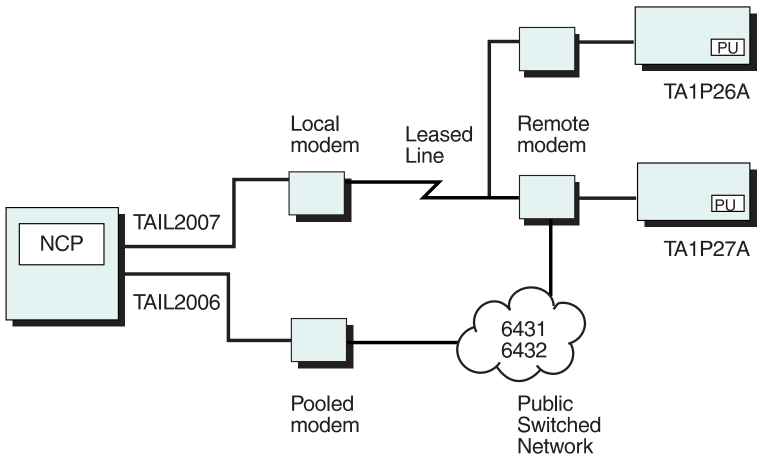


Figure 35. Multipoint Sample Configuration—Modem Pool

Table 20. Modem Configuration for Multipoint—Modem Pool

Function	Local modem	Pooled modem	Remote modem 1	Remote modem 2
Address	01	01	C2	C1
Speed	9600	9600	9600	9600
LPDA2	ENABLED	ENABLED	ENABLED	ENABLED
Feature	FIFO	—	FIFO	—
Control	MTP C	MTP C	MTP T	MTP T
XMIT clock	INT	–	RCV	RCV

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),POOL=PU2,APO=Y,RECONN=Y
SNBUPOOL PU2
PU2 TA1L2007
```

Note: APO=Y (alternate port only) indicates that only the pool modems are selected for AON/SNA SNBU.

Fanout Sample Configuration—Same Modem

The following diagram shows a fanout sample configuration on the same modem.

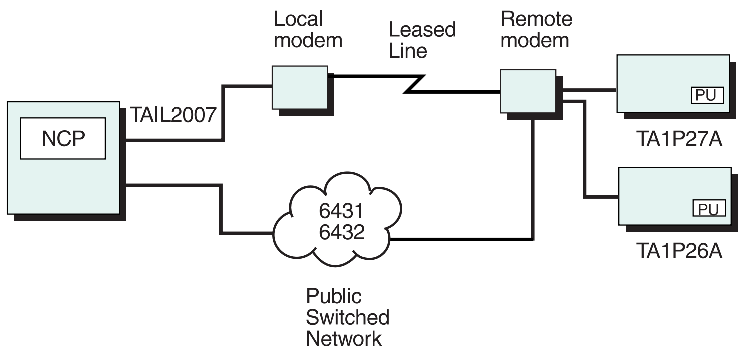


Figure 36. Fanout Sample Configuration—Same Modem

Table 21. Modem Configuration for Fanout—Same Modem

Function	Local modem	Remote modem
Address	01	C2
Speed	9600	9600
LPDA2	ENABLED	ENABLED
Feature	FIFO	FIFO
Control	MTP C	MTP T
XMIT clock	INT	RCV

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),FANOUTS=TA1P26A,RECONN=Y
```

Fanout Sample Configuration—Modem Pool

The following diagram shows a fanout sample configuration modem pool.

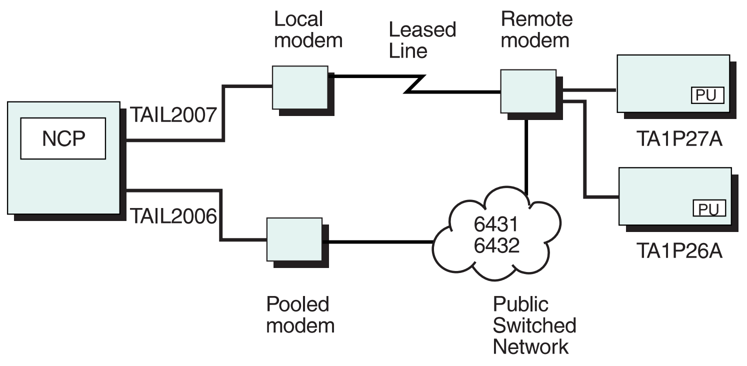


Figure 37. Fanout Sample Configuration—Modem Pool

Table 22. Modem Configuration for Fanout—Modem Pool

Function	Local modem	Pooled modem	Remote modem
Address	01	01	C2
Speed	9600	9600	9600
LPDA2	ENABLED	ENABLED	ENABLED
Feature	FIFO	—	FIFO
Control	MTP C	MTP C	MTP T
XMIT clock	INT	INT	RCV

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),POOL=PU2,APO=Y,
     FANOUTS=TA1P26A,RECONN=Y
SNBUPOOL PU2
PU2 TA1L2007
```

Multiport (DMPX) Sample Configuration—Same Modem

The following diagram shows a multiport (DMPX) sample configuration on the same modem.

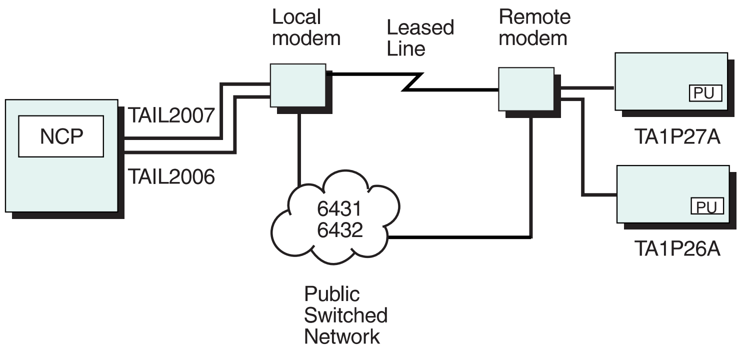


Figure 38. Multiport (DMPX) Sample Configuration—Same Modem

An alternate port AON/SNA SNBU is not supported for DMPX.

Table 23. Modem Configuration for Multiport (DMPX)—Same Modem

Function	Local modem	Remote modem
Address	01	C2
Speed	19200	19200
LPDA2	ENABLED	ENABLED
Feature	DMPX	DMPX
Control	PTP P	PTP S
XMIT clock	INT	RCV
DMPX Options A FULL SPD	9600	9600

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),FANOUTS=TA1P26A,RECONN=Y
```

Tailing—Same Modem (LSL1)

The following diagram shows a detailed modem configuration with AON/SNA SNBU enabled for line segment for link segment level 1:

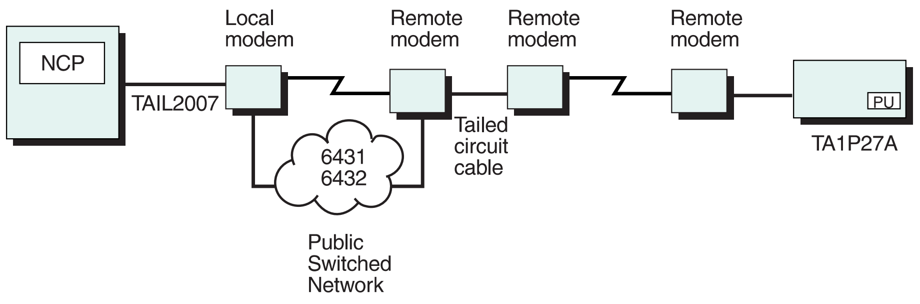


Figure 39. Tailing—Same Modem (LSL1)

Table 24. Modem Configuration for Tailing—Same Modem (LSL1)

Function	Local modem– Level 1	Remote modem– Level 1	Remote modem– Level 2	Remote modem– Level 2
Address	01	C2	02	C2
Speed	9600	9600	9600	9600
Speed CTL	MODEM	MODEM	DTE	MODEM
LPDA2	ENABLED	ENABLED	ENABLED	ENABLED
Feature	FIFO	FIFO	—	—
Control	PTP P	PTP S	PTP P	PTP S
XMIT clock	INT	RCV	EXT	RCV

Control file entry:

```
SNBU TA1P27A,AUTOSW=Y,AUTOBK=Y,PH=(6431,6432),RECONN=Y,LEVEL=1
```

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