IBM System Storage N series
Brocade 300 and Brocade 5100 Switch Configuration Guide

GC53-1167-00
NA 210-04419_A0

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Table of Contents

Preface

About this guide

This guide describes how Brocade® 300 (IBM® System Storage SAN24B-4 Express) and Brocade 5100 (IBM System Storage SAN40B-4) switch models operate with a MetroCluster and how to configure these switches in a fabric-attached MetroCluster. The guide also describes how to cable virtual channels and how to use zoning and traffic isolation zoning.

Brocade and IBM product and model number matrix

The following table identifies IBM products that are equivalent to the Brocade products mentioned in this publication.

The term *switch* is used in this guide to refer to the Brocade 300 and Brocade 5100 switches and their IBM equivalents, except where the name of a specific model is required for clarity.

Brocade product name	IBM product name	IBM machine type and model number
Brocade 300	IBM System Storage SAN24B-4 Express	2498 Models B24 and 24E
Brocade 5100	IBM System Storage SAN40B-4	2498 Models B40 and 40E

Audience

This guide is for system administrators who are familiar with operating systems that run on the storage system's clients, such as UNIX®, Linux®, and Windows® 2003. It also assumes that you are familiar with how to configure the storage system and how the NFS, CIFS, and HTTP protocols are used for file sharing or transfers. This guide does not cover basic system or network administration topics, such as IP addressing, routing, and network topology; it emphasizes the characteristics of the storage system.

Supported features

IBM System Storage™ N series systems and expansion boxes are driven by NetApp® Data ONTAP® software. Some features described in the product software documentation are neither offered nor supported by IBM. Please contact your local IBM representative or reseller for further details. Information about supported features can also be found at the following Web site:

www.ibm.com/storage/support/nas/

A listing of currently available N series products and features can be found at the following Web site:

www.ibm.com/storage/nas/

Getting information, help, and service

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your IBM System Storage N series product, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected properly.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation and use the diagnostic tools that come with your system.
- Use an IBM discussion forum on the IBM Web site to ask questions.

Using the documentation

Information about the N series product and Data ONTAP software is available in printed documents and a documentation CD that comes with your system. The same documentation is available as PDF files on the IBM NAS support Web site:

www.ibm.com/storage/support/nas/

Data ONTAP software publications are available as PDF files on the IBM NAS support Web site:

www.ibm.com/storage/support/nas/

Web sites

IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates.

- For NAS product information, go to the following Web site:
  www.ibm.com/storage/nas/
- For NAS support information, go to the following Web site:
  www.ibm.com/storage/support/nas/

- For AutoSupport information, go to the following Web site:
  www.ibm.com/storage/support/nas/

Accessing online technical support

For online Technical Support for your IBM N series product, visit the following Web site:

www.ibm.com/storage/support/nas/

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services. Visit the following Web site for support telephone numbers:

www.ibm.com/planetwide

Supported servers and operating systems

IBM N series products attach to many servers and many operating systems. To determine the latest supported attachments, follow the link to the Interoperability matrices on the following Web site:

www.ibm.com/storage/support/nas/

Drive firmware updates

As with all devices, it is recommended that you run the latest level of firmware, which can be downloaded by visiting the following Web site:

www.ibm.com/storage/support/nas/

Verify that the latest level of firmware is installed on your machine before contacting IBM for technical support. See the *Software Setup Guide* for more information on updating firmware.

Terminology

Storage systems that run Data ONTAP are sometimes also referred to as *appliances*, *storage appliances*, or *systems*. The name of the graphical user interface for Data ONTAP (*FilerView*) reflects one of these common usages.

FilerView as an alternative to commands

As a storage system administrator, you can perform tasks by entering commands at the console, in configuration files, or through a Telnet session or Remote Shell connection.

Another method of performing common tasks is to use the FilerView® graphical management interface for viewing and managing a storage system from a Web browser. FilerView is easy to use, and it includes Help that explains FilerView features and how to use them.

For more information about accessing a storage system using FilerView, and about FilerView Help, see the *Storage Management Guide*.

Command conventions

You can enter storage system commands on the system console or from any client that can obtain access to the storage system using a Telnet session. In examples that illustrate commands executed on a UNIX workstation, the command syntax and output might differ, depending on your version of UNIX.

Formatting conventions

The following table lists different character formats used in this guide to set off special information.

Formatting convention	Type of information
Italic type	◆ Words or characters that require special attention. ◆ Placeholders for information you must supply. For example, if the guide requires you to enter the `fctest` *adaptername* command, you enter the characters "fctest" followed by the actual name of the adapter. ◆ Book titles in cross-references.
`Monospaced` font	◆ Command and daemon names. ◆ Information displayed on the system console or other computer monitors. ◆ The contents of files.
`Bold monospaced` font	Words or characters you type. What you type is always shown in lowercase letters, unless your program is case-sensitive and uppercase letters are necessary for it to work properly.

Keyboard conventions

This guide uses capitalization and some abbreviations to refer to the keys on the keyboard. The keys on your keyboard might not be labeled exactly as they are in this guide.

What is in this guide…	What it means…
hyphen (-)	Used to separate individual keys. For example, Ctrl-D means holding down the Ctrl key while pressing the D key.
Enter	Used to refer to the key that generates a carriage return; the key is named Return on some keyboards.
type	Used to mean pressing one or more keys on the keyboard.
enter	Used to mean pressing one or more keys and then pressing the Enter key.

Special messages

This guide contains special messages that are described as follows:

Note

A note contains important information that helps you install or operate the system efficiently.

Attention

An attention notice contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.

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Fabric MetroCluster Overview 1

About this chapter This chapter introduces the MetroCluster configuration and switch fabrics.

Topics in this chapter This chapter discusses the following topic: "Fabric MetroCluster Switch Overview" on page 2.

Fabric MetroCluster Switch Overview

Data ONTAP® requirements for these switches

These switches (and IBM equivalents) require one of the following Data ONTAP® releases to be used in a MetroCluster configuration:

- 7.2.5.1
- 7.2.6 and later
- 7.3 and later

SFP requirements for these switches

These switches can be used with Brocade small-form pluggables (SFPs) that are set to either 4 Gbit, 2 Gbit, or 1 Gbit per second.

Description of a MetroCluster configuration

The MetroCluster configuration uses two storage systems that are connected to provide high availability and data mirroring. You can place these two systems in different locations. When the distance between the two systems is greater than 500 meters, you use four Fibre Channel switches in a fabric configuration to connect the two systems. This configuration is called a *fabric-attached MetroCluster.*

Definition of MetroCluster switch fabrics

A fabric-attached MetroCluster contains two switch fabrics. A *switch fabric* consists of a switch on the local half of the MetroCluster connected to a switch on the remote half of the MetroCluster. The two switches are connected to each other through long-distance Inter-Switch Link (ISL) cables, as shown in the following illustration.

Note

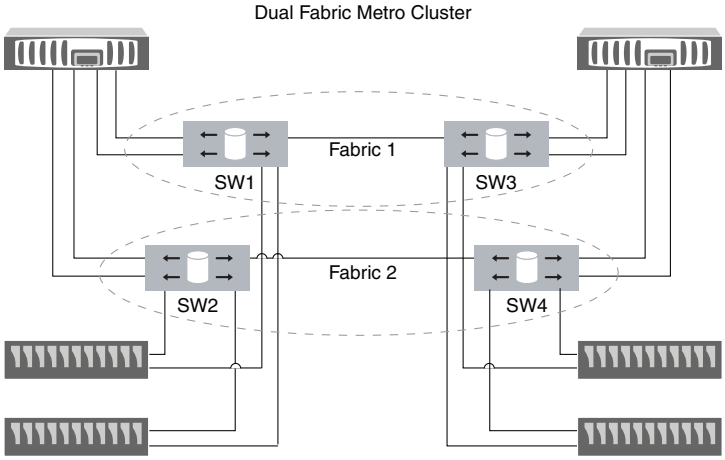
Do not mix switch models within a single fabric-attached MetroCluster or across a fabric-attached MetroCluster.

Sample diagram of a MetroCluster switch fabric

For example, consider a Fabric MetroCluster configuration in which the first fabric begins at Switch 1 on the local node and is completed by connecting the ISL cable to the first switch (Switch 3) on the remote node.

The second fabric is created using Switch 2 on the local node, connected through a second ISL cable to the second switch (Switch 4) on the remote node.

This example is illustrated in the following diagram.



Switch Ports 2

About this chapter

This chapter illustrates switch ports and how they are grouped into port groups.

Topics in this chapter

This chapter discusses the following topics:

How switch ports are grouped

Port groupings

The switch ports are divided into eight-port groups. The number of groups available differs, based on the total number of ports enabled with the Ports on Demand (POD) license. See the sections that follow for each individual switch.

Note

Do not install Small Form Pluggables (SFPs) in non-licensed ports. This might cause Data ONTAP to erroneously assign pools to the unlicensed ports.

Ports and port groups in the Brocade 300 switch

The Brocade 300 switch has 24 ports, but can be licensed as an 8-port switch, a 16-port switch, or a 24-port switch. The ports auto-sense link speeds and support transfer rates of 1, 2, and 4 Gbits per second.

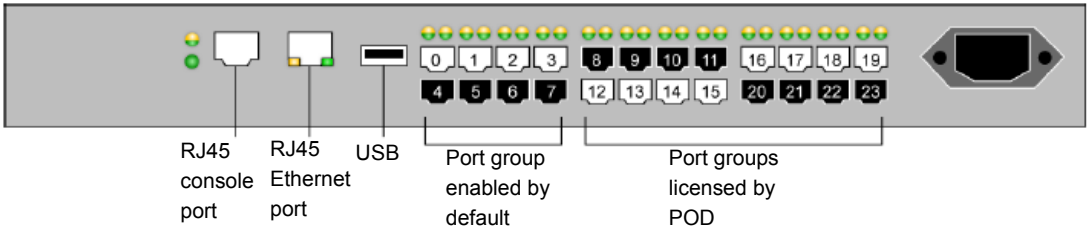
Note

You cannot use the auto-sensing speed mode with switch ports that are connected to FC-VI adapter ports, FC initiator adapter ports, or storage loops. You must set the speed of these switch ports to the speed supported by the port at the other end of the link by using the **`portcfgspeed`** command. See "Completing the configuration" on page 20.

Note

If you are using SFPs with the switches, the 8 Gbit SFPs are supported only with the transfer rates 2 or 4 Gbits per second; 4 Gbit SFPs are supported only with the transfer rates 1, 2, or 4 Gbits per second.

See the following diagram for port numbering. Ports 0 through 7 are enabled by default. Ports 8 through 15 and ports 16 through 23 can also be licensed.



Ports and port groups in the Brocade 5100 switch

The Brocade 5100 switch has 40 ports, but can be licensed as an 24-port switch, a 32-port switch, or a 40-port switch. The ports auto-sense link speeds and support transfer rates of 1, 2, and 4 Gbits per second.

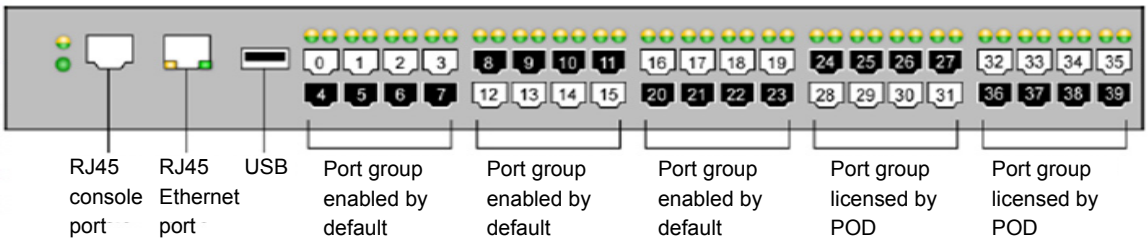
Note

You cannot use the auto-sensing speed mode with switch ports that are connected to FC-VI adapter ports, FC initiator adapter ports, or storage loops. You must set the speed of these switch ports to the speed supported by the port at the other end of the link by using the **`portcfgspeed`** command. See "Completing the configuration" on page 20.

Note

If you are using SFPs with the switches, the 8 Gbit SFPs support only the transfer rates 2 or 4 Gbits per second; 4Gbit SFPs support only the transfer rates 1, 2, or 4 Gbits per second.

See the following diagram for port numbering. Ports 0 through 23 are enabled by default. Ports 24 through 31 and ports 32 through 39 can also be licensed.



Virtual Channel Cabling 3

About this chapter

This chapter describes the virtual channel feature and provides sample cabling diagrams for virtual channels.

Topics in this chapter

This chapter discusses the following topics:

Description of the virtual channel feature

Virtual channel feature platform requirement

To use the virtual channel feature, your storage system platforms must use software-based disk ownership.

Hardware-based disk ownership must be used in a MetroCluster when your storage systems are IBM System Storage N5200 or IBM System Storage N5500. All other storage system platforms qualified for MetroCluster use software-based disk ownership.

Note

Hardware-based disk ownership is not supported when using the Brocade 5100 switch. Therefore, you cannot use the Brocade 5100 switch in a MetroCluster that uses IBM System Storage N5200 or IBM System Storage N5500 storage systems.

Distance consideration for virtual channels

The virtual channel feature can be used only with ISLs that are 10km or less. When the ISL distance is greater than 10 KM, all virtual channels are collapsed into one for buffer credit purposes.

What the virtual channel feature does

You can use the virtual channel feature to separate cluster interconnect (FCVI) traffic and ISL traffic from storage traffic. This ensures ISL reliability by preventing port blocking. When you use virtual channel technology, no single controller can monopolize all the bandwidth of an ISL and block out traffic from other controllers.

The virtual channel feature logically partitions bandwidth within each ISL into eight virtual channels. Storage system platforms that support software-based disk ownership enable you to use virtual channel technology to isolate interconnect traffic from the storage traffic stream.

Virtual channel technology applies only to ISLs. Each of the eight virtual channels within an ISL includes a physical circuit as well as components for flow control and buffer credit management.

Virtual channel and destination port map

Virtual channel and destination port mapping limitations

You can map each virtual channel to up to ten destination ports, depending on how many of your switch ports are enabled.

The eight virtual channels are numbered 0 through 7. You can use virtual channels 2 through 5 for either Class 2 or Class 3 data traffic.

Map of virtual channels to ports

The following table shows how the virtual channels map to switch destination ports and the typical usage of the virtual channels.

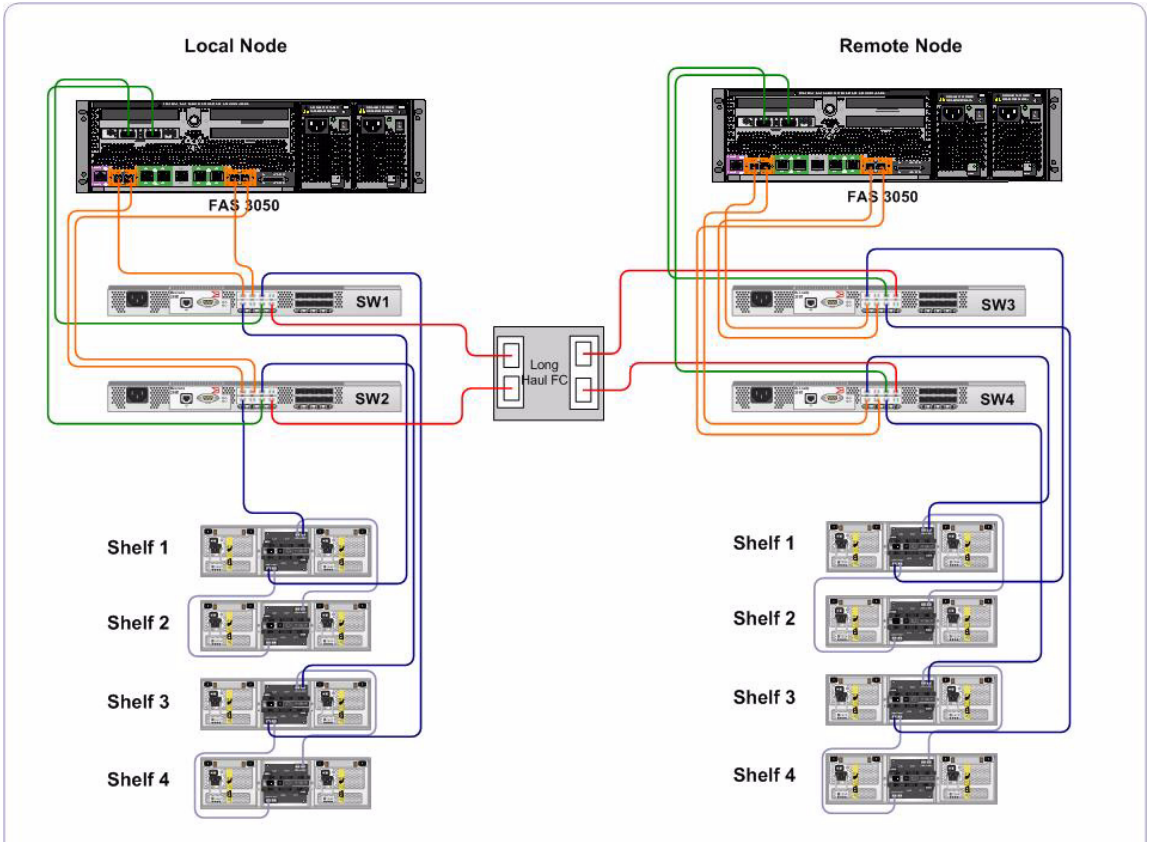
Virtual channel	Destination ports 8-port switch	Destination ports for 16-port switch	Destination ports for 24-port switch	Destination ports for 32-port switch	Destination ports for 40-port switch	Usage
2	0, 4	0, 4, 8, 12	0, 4, 8, 12, 16, 20	0, 4, 8, 12, 16, 20, 24, 28	0, 4, 8, 12, 16, 20, 24, 28, 32, 36	Interconnect and ISL traffic
3	1, 5	1, 5, 9, 13	1, 5, 9, 13, 17, 21	1, 5, 9, 13, 17, 21, 25, 29	1, 5, 9, 13, 17, 21, 25, 29, 33, 37	Storage traffic
4	2, 6	2, 6, 10, 14	2, 6, 10, 14, 18, 22	2, 6, 10, 14, 18, 22, 26, 30	2, 6, 10, 14, 18, 22, 26, 30, 34, 38	Storage traffic
5	3, 7	3, 7, 11, 15	3, 7, 11, 15, 19, 23	3, 7, 11, 15, 19, 23, 27, 31	3, 7, 11, 15, 19, 23, 27, 31, 35, 39	Storage traffic

Virtual channel cabling

Sample diagram of Brocade 300 8-port cabling

The following sample diagram shows 8-port cabling, using Brocade 300 switches to create a Fabric MetroCluster.

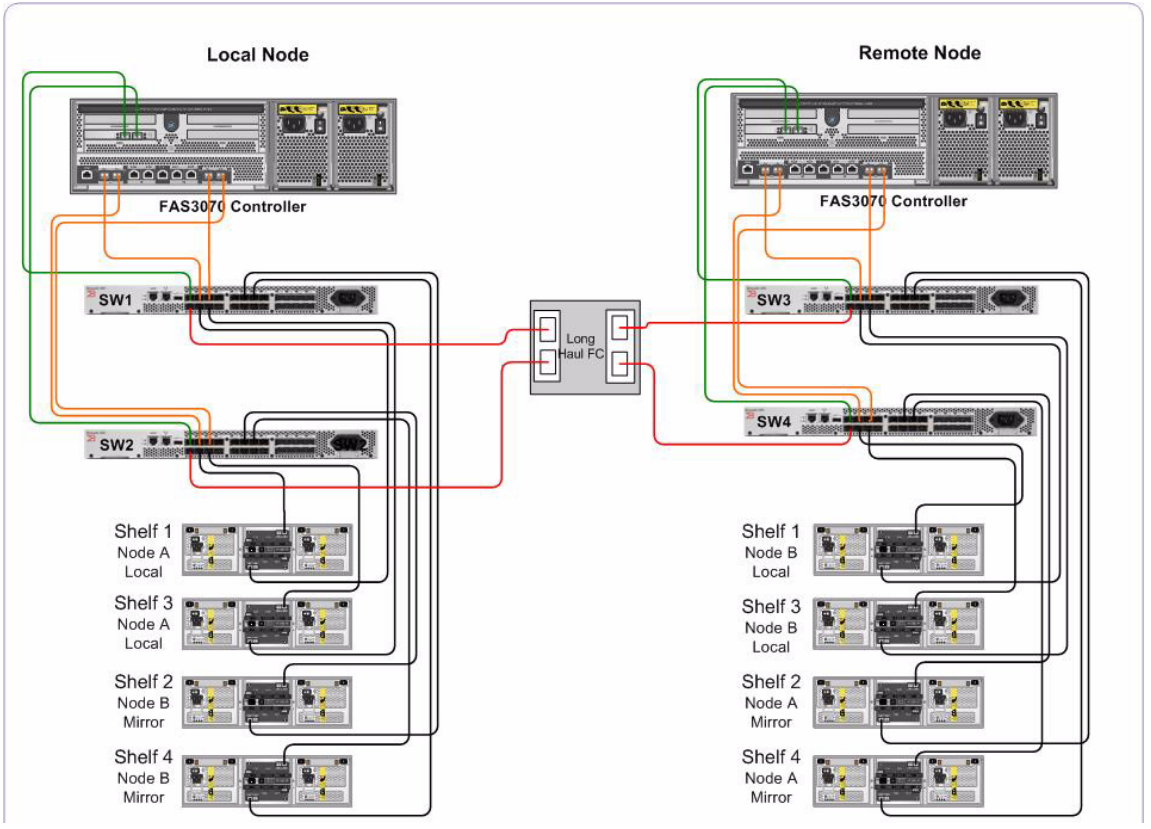
You should spread disk shelves across ports before adding a second shelf to each loop.



Sample diagram of Brocade 300 16-port cabling

The following sample diagram shows 16-port cabling, using Brocade 300 switches to create a Fabric MetroCluster.

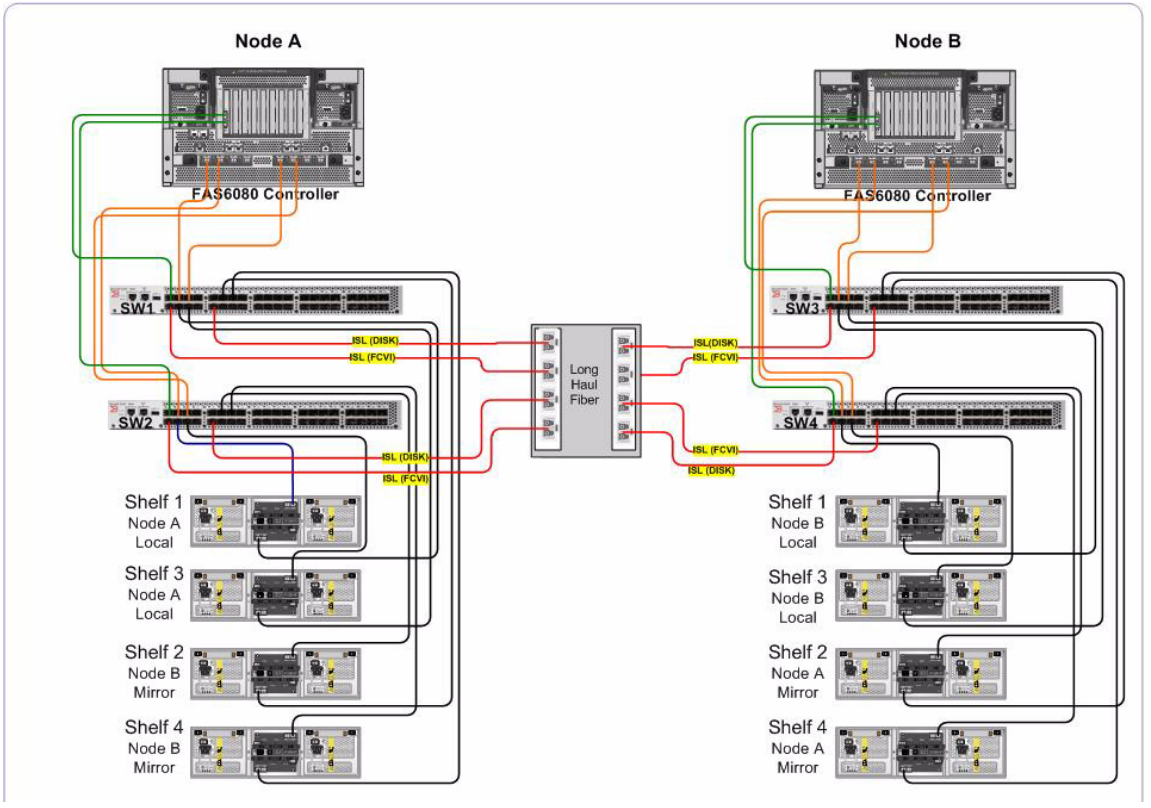
You should spread disk shelves across ports before adding a second shelf to each loop.



Sample diagram of Brocade 5100 40-port cabling

The following sample diagram shows 40-port cabling, using Brocade 5100 switches to create a Fabric MetroCluster.

You should spread disk shelves across ports before adding a second shelf to each loop.



Configuring Switches 4

About this chapter

This chapter explains how to configure a switch.

Topics in this chapter

This chapter discusses the following topics:

Configuring a switch

Before you begin

Configuring these switches for a fabric-attached MetroCluster includes the following tasks:

- Configuring the switch initially
- Setting the switch parameters

Before you begin the configuration, note the following information:

- These procedures must be performed on each switch in the MetroCluster configuration.
- You must use these procedures instead of the switch configuration procedures in the *Cluster Installation and Administration Guide* or the *Active/Active Configuration Installation and Administration Guide*.

Configuring a switch initially

To configure a switch initially, complete the following steps.

Note

For all of the Brocade switch commands, see the *Brocade Fabric OS Command Reference Manual Supporting Fabric OS 6.1* for information about command syntax and options.

Step	Action
1	If this switch has not been configured before, log in to the switch, using the console port and your Windows HyperTerminal application (not available in Windows Vista versions), and set the following values, as described in the switch hardware reference manual for your switch: ◆ IP address ◆ Default account passwords (administrator and user) ◆ Date and time **Note** Use the `telnet` command for subsequent switch login sessions, using the switch IP address.

Step	Action
2	Set the IP address for the switch by using the following command. **`ipaddrset sw <switch number>`** For example, to set the addresses for switch number 1: **`ipaddrset sw 1`**
3	Set the password by using the following command: **`passwd <user_account>`**
4	Synchronize timestamps across the switch and controllers on the NTP server by using the following command: **`tsclockserver <ntp-ip-address>; <ntp-ip-address>`** For example: **`tsclockserver 123.123.123.123`**
5	Set the time zone for the switch by using the following command, which allows you to choose from lists of available selections: **`tstimezone --interactive`**
6	Set the idle timeout value for a switch login session by using the following command (the default is 10 minutes). **`timeout <minutes>`** For example: **`timeout 60`**
7	Display the licenses installed on the switch by entering the following command: **`licenseshow`** **Result:** You should have the following licenses: ◆ Fabric License (or two Domain Licenses) ◆ Extended Fabric License (for ISL distances over 10 km) If you do not have these licenses, contact your sales representative before proceeding.

Step	Action
8	Set the switch name, if needed, by entering the following command: **`switchname`** ***`switch_name`*** **Note** Use a name that is meaningful, such as node name and switch.
9	Determine the switch firmware by entering the following command: **`version`** **Result:** The currently installed switch firmware is displayed.
10	Access the *IBM N series Fabric MetroCluster Switch Interoperability Matrix* at www.ibm.com/storage/support/nas/ to identify the currently supported version of the switch firmware.
11	If your switch firmware is not the supported version, complete the following substeps: **a.** Download the switch firmware from www.brocade.com/support/downloads.jsp and install it, as described in the Brocade switch hardware reference manual for your switch. **b.** Reboot the switch.

Setting the switch parameters

After performing the initial switch configuration, set the switch parameters by completing the following steps.

Step	Action
1	Disable the switch by entering the following command: **`switchdisable`**
2	Clear any preexisting configuration by entering the following commands: **`cfgclear`** **`cfgdisable`** **`cfgsave`**
3	Configure the switch with default settings by entering the following command: **`configdefault`**
4	Set the switch parameters by entering the following command: **`configure`** **Note** The domain ID might be specified by your system administrator. If not, you can use any unique number, for example, 1, 2, 3, or 4. You should set only the following parameters: ◆ `Fabric parameters = y` ❖ `Domain_id = XXX` ❖ `Disable device probing = 1` ◆ `Arbitrated Loop parameters = y` ❖ `Send FAN frames = 0`

Completing the configuration

Steps

After setting the switch parameters, complete the configuration by performing these steps.

Step	Action
1	Exit the configuration utility by entering the following command: **`ctrl-d`**
2	Reboot the switch so that the new settings take effect by entering the following command: **`fastboot`**
3	Log in to the switch and disable it by entering the following command: **`switchdisable`**
4	Complete the following substeps only for the ports to which disks are attached: **a.** Set all ports attached to disk loops to half duplex by entering the following command for each port number: **`portCfgLPort <disk_port>,0,0,1`** **b.** Set all ports attached to disk loops to Locked L-Port by entering the following command for each port number: **`portCfgLPort <disk_port>,1,0,1`**

Step	Action
5	If you have switch ports that are attached to FC-VI adapters, FC initiator adapters, or disk shelf loops, set the switch port speed to the actual speed supported by the FC-VI adapter ports, the FC initiator adapter ports, or the disk shelf ports. **Note** Switch ports attached to FC-VI adapters, FC initiator adapters and disk shelves loops cannot use speed auto-sensing mode. The speed must be set to the actual speed supported by the FC-VI adapter ports, the FC initiator adapter ports or the disk shelves ports. Set the switch port speed by using the following command: **portcfgspeed *port_number, speed*** For example, if each FC-VI adapter port supports 4Gbits per second, each switch port connected to an FC-VI adapter must be configured with a speed of 4Gbits per second using: *portcfgspeed <port number>, 4*
6	Ensure that the disk loop port is showing ON in both the Locked L_Port and Locked Loop HD fields by entering the following commands: **portCfgShow** **portCfglport** **Result:** ON is displayed in both the Locked L_Port and Locked Loop HD fields.
7	If your switch has the trunking license installed, disable trunking on the ISL port by entering the following command: **portcfgtrunkport <*ISL_port#*> 0**

Step	Action
8	To configure the long-distance ISL port for your ISL length, enter the following command: **portcfglongdistance [*slotnumber/portnumber*] [*distance_level*] [*VC_Translation_Link_Init*] [*desired_distance*]** *distance_level* is one of the following values: ◆ As a normal switch port, use LO. ◆ For distances up to 10 km, use LE. ◆ For distances beyond 10 km, use LS. Specify 1 to activate long-distance link initialization sequence, or specify 0 to deactivate this mode. Then specify the distance. **Example:** If your ISL length is 18 km and your ISL is connected to port 13, you use the following command: **portCfgLongDistance 13 LS 1 18**
9	Enable the switch by entering the following command: **switchenable**
10	Verify that the switch settings are correct by entering the following command: **configshow**

Switch Zoning 5

About this chapter

This chapter describes how to configure zones on the primary and secondary fabric of a switch.

Topics in this chapter

This chapter discusses the following topics:

Zoning feature description

Zoning feature requirements

No additional license is needed for zoning. The zoning license is enabled by default when the switches are shipped.

Zoning feature uses

You can use the zoning feature to set up two or more *zones* on the same switch. Zones let you arrange fabric-connected storage devices into logical groups, or zones, over the physical configuration of the fabric.

Zone members can access only other members of the same zone. You can use zones to provide controlled access to fabric segments and to establish barriers between operating environments. For example, you can isolate systems with different uses or protect systems in a heterogeneous environment.

Configuring zones on the primary and secondary fabric

Configuration rules

You need to create two zones on a switch—a zone for a Fibre Channel Virtual Interface (FCVI) from a local node to a remote node, and a second zone from the local node to local storage shelves.

You configure these zones on a primary and a secondary fabric.

Note
You must configure the primary and the secondary fabrics separately.

Note
You cannot include the ISL port in a zone. You can use any other port. For more information, search for the *Active/Active Configuration Guide* for your version of Data ONTAP at www.ibm.com/storage/support/nas .

Configuring zones on the primary fabric

To configure zones on the primary fabric of a switch, complete the following steps.

Step	Action
1	Connect to a switch in the primary fabric by using the `telnet` command. For example, log in to switch 1.

Step	Action
2	Create a zone for the FCVI traffic by entering the following command: **zonecreate "*zonename*", "*switch,port; switch,port*"** *zonename* is the name of the zone. *switch,port* is the switch ID and port number you want to include in this zone. **Example** The following example creates a zone called “FCVI” that includes switch 1, port 0 on the local node, and switch 3, port 0 on the remote node. **zonecreate "FCVI", "1,0; 3,0"**
3	Create a zone for the storage traffic from the local node to local disk shelves by entering the following command: **zonecreate "*zonename*", *switch,port*** *zonename* is the name of the zone. *switch,port* is the switch ID and port number you want to include in this zone. **Example** The following example creates a zone called "STOR" that includes switch 1 ports 1, 5, 6, 9, and 10; and switch 3 ports 1, 5, 6, 9, and 10. **zonecreate "STOR", "1,1; 1,5; 1,6; 1,9; 1,10; 3,1; 3,5; 3,6; 3,9; 3,10"**
4	Create the zoned configuration by entering the following command: **cfgcreate "*Zone_<name>*" <*zonename*>; <*zonename*>** Enter the zoned configuration name followed by the names of the zones you created in the previous steps. **Example** The following example creates a zoned configuration named “Zone_net” that includes the zones named FCVI and STOR. **cfgcreate "Zone_net", FCVI; STOR**

Step	Action
5	Save and enable the zoned configuration by entering the following command: **`cfgenable "Zone_<name>"`** **Example** The following example saves and enables the Zone_net zoned configuration. **`cfgenable "Zone_net"`** **Note** Alternatively, you can save the zoned configuration into flash memory by using the command **`sfgsave`** instead of **`cfgenable`**.
6	View the effective zoned configuration at any time by entering the following command: **`cfgshow`**

Configuring zones on the secondary fabric

Repeat the previous procedure to configure zones on the secondary fabric. Follow these steps.

Step	Action
1	Connect to a switch in the secondary fabric by using the `telnet` command. For example, log in to switch 2.
2	Create a zone for the FCVI traffic by entering the following command: **`zonecreate "zonename", switch;port`** *zonename* is the name of the zone. *switch,port* is the switch ID and port number you want to include in this zone. **Example** The following example creates a zone called “FCVI” that connects switch 2, port 0 on your local node and switch 4, port 0 on your remote node. **Note** Because switches 1 and 3 are on a different fabric than switches 2 and 4, you can use the same zone names on the primary and secondary fabrics for simplicity. **`zonecreate "FCVI", "2,0; 4,0"`**

Step	Action
3	Create a zone for the storage traffic from the local node to local disk shelves by entering the following command: **zonecreate "*zonename*", *member;member*** *zonename* is the name of the zone. *member* is the switch ID and port number you want to include in this zone. **Example** The following example creates zone "STOR" that includes switch 2 ports 1, 5, 6, 9, and 10; and switch 4 ports 1, 5, 6, 9, and 10. **zonecreate "STOR", "2,1; 2,5; 2,6; 2,9; 2,10; 4,1; 4,5; 4,6; 4,9; 4,10"**
4	Create the zoned configuration by entering the following command: **cgfcreate "*Zone_<name>*" *<zonename>; <zonename>*** Enter the zoned configuration name followed by the names of the zones you created in the previous steps. **Example** The following example creates a zoned configuration named "Zone_net" that includes the zones named FCVI and STOR. **cfgcreate "Zone_net", FCVI; STOR**
5	Save and enable the zoned configuration by entering the following command: **cfgenable "*Zone_<name>*"** **Example** The following example saves and enables the Zone_net zoned configuration. **cfgenable "Zone_net"** **Note** Alternatively, you can save the zoned configuration into flash memory by using the command **cfgsave** instead of **cfgenable**.

Step	Action
6	View the effective zoned configuration at any time by entering the following command: **`cfgshow`**

Traffic Isolation 6

About this chapter

This chapter describes the Traffic Isolation (TI) features available for the switches, including TI zone failover, TI zone rules, and configuration of TI zones.

Topics in this chapter

Traffic Isolation feature description

Description of the TI feature

In the Brocade Fabric Operating System 6.0b and later, you can dedicate Inter-Switch links (ISLs) to certain traffic. The TI feature enables you to control the flow of ISL traffic by creating a dedicated path for traffic flowing from a specific set of source ports (N_Ports).

The TI feature helps Fibre Channel Virtual Interface (FCVI) messages, which are considered high-priority traffic, avoid interruption or congestion caused by storage traffic.

TI feature requirements

Note the following requirements for using the TI feature:

- The TI feature requires Data ONTAP 7.2.6.1 or later.
- Ports in a TI zone must belong to switches that run Brocade Fabric OS 6.0b or later.

TI feature usage examples

You can use the TI feature in the following scenarios:

- When you want to dedicate an ISL to high-priority, host-to-target traffic such as cluster interconnect traffic, such as that for miroring NVRAM.
- When you want to force high-volume, low-priority traffic onto a particular ISL to limit the effect of this high traffic pattern on the fabric.

How TI zones work

Implementing traffic isolation involves using a special zone, called a TI zone. A TI zone indicates the set of ports and ISLs that will be used for a specific traffic flow.

When you activate a TI zone, the fabric attempts to isolate all ISL traffic entering from a member of the zone to only those ISLs that are included in the zone. The fabric also attempts to exclude traffic not in the TI zone from using ISLs within that TI zone.

TI zone failover operation

Failover operation when TI zone failover is enabled

The TI feature contains a TI zone failover setting that you can enable or disable. When paths within a TI zone go offline, the TI zone failover setting determines the outcome. If you use the default settings when you create a TI zone, failover is automatically enabled.

When failover is enabled in traffic flow with TI zones, the following situations occur:

- If a TI-zoned route fails, traffic is moved to another E_Port in the same TI zone.

  If no other E_Ports are available in that TI zone, traffic is moved to another equivalent-cost E_Port, if available.
- When a failed TI-zoned route is restored, traffic is automatically failed back to the original route.
- If the dedicated ISL fails, traffic is routed onto the non-dedicated ISL, because it is the only available route.

Failover operation when TI zone failover is disabled

When failover is disabled in traffic flow with TI zones and the TI-zoned E_Port fails, the following occurs:

- A Registered State Change Notification is generated listing the path failure.

  TI moves traffic to another E_Port in the same TI zone, if one is available, but does not move traffic to an E_port outside of the TI zone.
- When a failed TI-zoned route is restored, traffic automatically fails back to the original route and a Registered State Change Notification is generated listing the path restoration.
- If the dedicated ISL fails, traffic is not routed onto the nondedicated ISL and the TI-zoned route remains inoperable.

TI zone configuration rules

Configuration rules for TI zones

The following configuration rules apply to TI zones:

- A given N_Port can be a member of only a single TI zone.

  This rule is enforced during zone creation or modification.
- An E_Port can be a member of only a single TI zone.

  The same checking is done as described for N_Ports.
- If multiple E_Ports on the lowest-cost route to a domain are configured, the various source ports for that zone are load balanced across the specified E_Ports.
- The TI zones appear in the defined zone configuration only and do not appear in the effective zone configuration.

  A TI zone only provides Traffic Isolation and is not a “regular” zone.
- A TI zone must include a set (two or more) of E_Ports forming an end-to-end path.

  Inclusion of N_Ports is optional.
- Each TI zone is interpreted by each switch, and each switch considers only the routing required for its local ports.

  No consideration is given to the overall topology or to whether the TI zones accurately provide dedicated paths through the whole fabric.
- You use the `zone` command with options to create and modify TI zones.

  You cannot use other zoning commands, such as `zoneCreate`, `aliCreate`, and `cfgCreate` to manage TI zones.

Configuring TI zones

Configuring TI zones with failover enabled

To create a TI zone with failover enabled and the TI zone activated on a primary fabric and a secondary fabric, complete the following steps.

The following sample procedure shows how to create a configuration that includes a TI zone, an FCVI zone, and a storage zone.

Note
You must configure the zones in the primary and the secondary fabrics separately.

Note
The examples in this procedure correspond with the diagram shown in "Sample diagram of Brocade 300 16-port cabling" on page 13.

Step	Action
1	Connect to a switch in the primary fabric by using the `telnet` command. For example, log in to switch 1.
2	Create a configuration on the primary fabric by using the `cfgcreate` command: **`cfgcreate`** "*`configuration name`*", "*`zonetype`*; *`zonetype`*; *`zonetype`*" *`configuration name`* is the name you give the configuration and *`zonetype`* is the type of zone you want to include in the configuration. ◆ `FCVI_TI` designates an FCVI TI zone. ◆ `FCVI` designates an FCVI zone. ◆ `STOR` designates a storage zone. For example, the following command creates a configuration named Zone_net that includes a TI zone, an FCVI zone, and a storage zone: **`cfgcreate "Zone_net", "FCVI_TI; FCVI; STOR"`**

Step	Action
3	Create the TI zone on the primary fabric by using the `zone --create` command. For detailed command syntax, see “TI zone command syntax” on page 41. **zone --create** [-t *objtype*] [-o *optionlist*} *zonename* -p [*portlist*] The following example creates a TI zone called FCVI_TI with failover enabled and the TI zone activated. The example includes switch 1 ports 0 and 4; and switch 3 ports 0 and 4. **Note** Failover enabled (option f) and TI zone activated (option a) are default settings, so you do not have to enter them in the command. **Note** Optionally, you can create the TI zone with failover disabled by including option d. For all options, see “TI zone command syntax” on page 41. **zone --create -t ti "FCVI_TI" -p "1,0; 1,4; 3,0; 3,4"**
4	Create the FCVI zone on the primary fabric by using the `zonecreate` command: **zonecreate** "*zonename*", "*switch,port*; *switch,port*" *zonename* is the name of the zone, and *switch,port* is the switch ID and port number that you want to include in this zone. The following example creates a zone called FCVI that includes switch 1, port 0 on the local node, and switch 3, port 0 on the remote node. **zonecreate "FCVI", "1,0; 3,0"**

Step	Action
5	Create the storage zone on the primary fabric by using the `zonecreate` command: **`zonecreate`** "*`zonename`*", "*`switch,port; switch,port`*" *`zonename`* is the name of the zone, and *`switch,port`* is the switch ID and port number that you want to include in this zone. The following example creates a zone called "STOR" that includes switch 1 ports 1, 5, 6, 9, and 10; and switch 3 ports 1, 5, 6, 9, 10. **`zonecreate "STOR", "1,1; 1,5; 1,6; 1;9; 1,10; 3,1; 3,5; 3,6; 3,9; 3,10"`**
6	Save the configuration by using the `cfgsave` command: **`cfgsave`**
7	Commit all commands and enable the configuration by using the `cfgenable` command: **`cfgenable`** "*`configuration name`*" For example, using the configuration name “Zone_net”: **`cfgenable "Zone_net"`**
8	Connect to a switch in the secondary fabric by using the `telnet` command. For example, log in to switch 2.

Step	Action
9	Create a configuration on the secondary fabric by using the `cfgcreate` command: **`cfgcreate`** "*`configuration name`*", "*`zonetype; zonetype; zonetype`*" *`configuration name`* is the name you give the configuration and *`zonetype`* is the type of zone you want to include in the configuration. ◆ `FCVI_TI` designates an FCVI TI zone. ◆ `FCVI` designates an FCVI zone. ◆ `STOR` designates a storage zone. **Note** Because switches 1 and 3 are on a different fabric than switches 2 and 4, you can use the same zone names on the primary and secondary fabrics for simplicity. For example, the following command creates a configuration named Zone_net that includes a TI zone, an FCVI zone, and a storage zone: **`cfgcreate "Zone_net", "FCVI_TI; FCVI; STOR"`**

Step	Action
10	Create the TI zone on the secondary fabric by using the `zone --create` command. For detailed command syntax, see "TI zone command syntax" on page 41. **zone --create** [-t *objtype*] [-o *optionlist*} *zonename* -p [*portlist*] The following example creates a TI zone called FCVI_TI with failover enabled and the TI zone activated. **Note** Failover enabled (option f) and TI zone activated (option a) are default settings, so you do not have to enter them in the command. **Note** Optionally, you can create the TI zone with failover disabled by including option d. For all options, see "TI zone command syntax" on page 41. **zone --create -t ti "FCVI_TI" -p "2,0; 2,4; 4,0; 4,4"**
11	Create the FCVI zone on the secondary fabric by using the `zonecreate` command: `zonecreate "`*zonename*`", "`*switch,port; switch,port*`"` *zonename* is the name of the zone, and *switch,port* is the switch ID and port number that you want to include in this zone. The following example creates a zone called FCVI that includes switch 2, port 0 on the local node, and switch 4, port 0 on the remote node. **zonecreate "FCVI", "2,0; 4,0"**

Step	Action
12	Create the storage zone on the secondary fabric by using the `zonecreate` command: **`zonecreate`** "*`zonename`*", "*`switch,port; switch,port`*" *`zonename`* is the name of the zone, and *`switch,port`* is the switch ID and port number that you want to include in this zone. The following example creates a zone called "STOR"that includes switch 2 ports 1, 5, 6, 9, and 10; and switch 4 ports 1, 5, 6, 9, 10. **`zonecreate "STOR", "2,1; 2,5; 2,6; 2,9; 2,10; 4,1; 4,5; 4,6; 4,9; 4,10"`**
13	Save the configuration by using the `cfgsave` command: **`cfgsave`** "*`configuration name`*" For example, using the configuration name “Zone_net”: **`cfgsave "Zone_net"`**
14	Commit all commands and enable the configuration by using the `cfgenable` command: **`cfgenable`** "*`configuration name`*" For example, using the configuration name “Zone_net”: **`cfgenable "Zone_net"`**

TI zone command syntax

TI zone command syntax

You can use the following commands when configuring TI zoning.

Note

`zone` commands are used only with the TI feature, not with existing zoning.

Note

A `cfgenable` command is required to commit all TI zone commands.

- You can create a TI zone with specified options and port list by entering the following command:

  `zone --create` `[-t objtype] [-o optionlist} zonename -p [portlist]`

  `-t` *objtype* is the type of zone. You use **`ti`** to specify a TI zone.

  `-o` *optionlist* is a list of options for activating the zone and controlling failover mode.

  - **`a`** means activate
  - **`d`** means deactivate
  - **`n`** means disable failover
  - **`f`** means enable failover

  zonename is the name that you want to give to the TI zone.

  `-p` *portlist* is the list of ports to be included in the TI zone. You designate ports by using the "*domain, index*" format. Multiple ports are separated by a semicolon, followed by a space.

Note

Failover enabled (option f) and TI zone activated (option a) are default settings, so you do not have to enter them in the command.

- You can activate a TI zone by entering the following command:

  `zone --activate` <*zonename*>

- You can deactivate a zone by entering the following command:

  `zone --deactivate` <*zonename*>

- You can delete TI zones from the defined configuration by entering the following command:

  zone --delete <*zonename*>

- You can view the effective TI zone configuration at any time by entering the following command:

  zone --show

Index

Numerics

B

C

D

E

F

I

K

M

P

R

S

T

V

Z

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Publication No. GC53-1167-00

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