hp StorageWorks

CLI reference guide for director 2/64, edge switch 2/16, and edge switch 2/32

Part Number: A6534-96027/AA-RQ7AB-TE

Second Edition (August 2002)

This guide covers the essentials of using a command line interface (CLI) to manage the Hewlett-Packard (HP) StorageWorks director 2/64, hp StorageWorks edge switch 2/16, and hp StorageWorks edge switch 2/32. Also included are CLI commands, syntax, purpose, and parameters.

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Contents

About This Guide

This reference guide provides information to use the command line interface (CLI) for the following Hewlett-Packard (HP) products:

- hp StorageWorks director 2/64.
- hp StorageWorks edge switch 2/16.
- hp StorageWorks edge switch 2/32.
- ha-fabric manager (HAFM) application.

Intended Audience

This publication is intended for data center administrators and customer support personnel who can enter CLI commands manually or write scripts. The primary purpose of the CLI is for scripts written by these administrators and personnel for use in a host-based scripting environment. Therefore, this publication presumes that the user is familiar with:

- Establishing and using a Telnet session.
- Using a terminal command line.
- Networking, SAN, and zoning concepts.
- HP products in the user's network.

Related Documentation

In addition to this guide, HP provides corresponding information:

- *hp StorageWorks product in a SAN environment - planning guide for director 2/64, edge switch 2/16, and edge switch 2/32, A6534-96025/AA-RS2DA-TE*
- *hp StorageWorks SNMP reference guide for director 2/64, edge switch 2/16, and edge switch 2/32, A6534-96026/AA-RQ7BB-TE*

- *hp StorageWorks director 2/64 installation guide, A6534-96110/AA-RSNGA-TE*
- *hp StorageWorks director 2/64 service manual, A6534-96022/AA-RS2EA-TE*
- *hp StorageWorks director 2/64 product manager user guide, A6534-96023/AA-RS2FA-TE*
- *hp StorageWorks director 2/64 release notes, A6534-96111/AV-RSNHA-TE*
- *hp StorageWorks m-series rack mount kit installation instructions, A6534-96028/AA-RQZPB-TE*
- *hp StorageWorks model A6534A/AZ torque tool caution flyer, A6534-96021/AA-RT4LA -TE*
- *hp StorageWorks universal port module kit installation instructions, A6574-96004/AA-RSS2A-TE*
- *hp StorageWorks HAFM server installation guide, A6582-96001/AA-RT4KA-TE*
- *hp StorageWorks ha-fabric manager user guide, A6534-96024/AA-RS2CA-TE*
- *hp StorageWorks ha-fabric manager release notes, A6575-96004/AV-RQZJC-TE*
- *hp StorageWorks edge switch 2/32 installation guide, A7283-96001/AA-RSTZA-TE*
- *hp StorageWorks edge switch 2/32 service manual, A7283-96002/AA-RS2GA-TE*
- *hp StorageWorks edge switch 2/32 product manager user guide, A7283-96003/AA-RS2HA-TE*
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- *hp StorageWorks edge switch 2/32 flexport upgrade instructions, A7290-96001/AA-RS33A-TE*
- *hp StorageWorks edge switch 2/16 installation guide, A7284-96001/AA-RSU2A-TE*
- *hp StorageWorks edge switch 2/16 service manual, A7284-96002/AA-RS2JA-TE*
- *hp StorageWorks edge switch 2/16 product manager user guide, A7284-96003/AA-RS2KA-TE*
- *hp StorageWorks edge switch 2/16 release notes, A7284-96004/AV-RSU3A-TE*
- *hp StorageWorks edge switch rack mount installation instructions, A7283-96004/AA-RT4MA-TE*
- *hp StorageWorks SFP transceiver installation instructions, A6534-96030/AA-RSS3A-TE*

Document Conventions

The conventions included in Table 1 apply.

Table 1: Document Conventions

Element	Convention
Cross-reference links	Blue text: Figure 1
Key names, menu items, buttons, and dialog box titles	**Bold**
File names, application names, and text emphasis	*Italics*
User input, command names, system responses (output and messages)	`Monospace font` `COMMAND NAMES` are uppercase unless they are case sensitive
Variables	*`Monospace, italic font`*
Website addresses	Sans serif font (http://thenew.hp.com)

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.

Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Rack Stability

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- **The leveling jacks are extended to the floor.**
- **The full weight of the rack rests on the leveling jacks.**
- **In single rack installations, the stabilizing feet are attached to the rack.**
- **In multiple rack installations, the racks are coupled.**
- **Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.**

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: http://thenew.hp.com.

HP Technical Support

In North America, call technical support at 1-800-652-6672, available 24 hours a day, 7 days a week.

NOTE: For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP website under support: http://thenew.hp.com/country/us/eng/support.html.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at: http://thenew.hp.com/country/us/eng/prodserv/storage.html. From this website, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP Authorized Reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: http://thenew.hp.com.

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Introduction

This chapter introduces the command line interface (CLI) and describes the essentials for using CLI commands.

Command Line Interface Overview

The CLI is a feature that provides director 2/64, edge switch 2/16, or edge switch 2/32 management capabilities. The CLI can only be used through a Telnet client session in an out-of-band management environment, using the Ethernet port in the director or switch.

The purpose of the CLI is to automate management of a large number of directors and switches through scripts. Although the primary use of the CLI is in host-based scripting environments, CLI commands can also be entered directly at a command line. Any hardware platform that supports the Telnet client software can be used.

Because the CLI is not an interactive interface, no prompts are displayed to guide the user through a task. If an interactive interface is needed, the ha-fabric manager (HAFM) application or embedded web server (EWS) application should be used instead of the CLI.

Entering Command Line Interface Commands

CLI commands can be entered directly at the command line of a workstation or coded in a script. CLI commands are not case sensitive.

Documentation Conventions

Throughout this publication, periods are used to separate components of a command name. However, periods cannot be included when the command is actually entered at a workstation or coded in a script. How to enter commands is explained in Navigation of the CLI Command Tree on page 1–6. Even though commands cannot be entered with periods, command line prompts do include periods as shown below:

```
Config.Port>
```

Navigation Conventions

Basic command line navigation conventions are supported. The following table includes asynchronous commands recognized by the CLI.

Table 1–1: CLI Command Tree Navigation Conventions

Character Sequence	Common Name	Action or Description
<CR>	Carriage Return	Pass a completed line to the parser.
<DEL>	Delete	Backspace one character and delete the character.
<NL>	New Line	Pass a completed line to the parser.
<SP>	Space	Used to separate keywords.
#	Pound Sign	Used to designate comments in a script.
?	Question Mark	Provide help information.
“	Quotation Mark	Used to surround a single token.
^A	Control-A	Position the cursor to the start of the line.
^B	Control-B	Position the cursor left one character.

Table 1–1: CLI Command Tree Navigation Conventions (Continued)

Character Sequence	Common Name	Action or Description
^D	Control-D	Delete the current character.
^E	Control-E	Position the cursor to the end of the line.
^F	Control-F	Position the cursor right one character.
^H	Control-H	Backspace one character and delete the character.
^I	Tab	Complete the current keyword.
^K	Control-K	Delete to the end of the line.
^L	Control-L	Redraw the line.
^N	Control-N	Move down one line in the command history.
^P	Control-P	Move up one line in the command history.
^R	Control-R	Redraw the line.
^U	Control-U	Clear the input and reset the line buffer.
^X	Control-X	Clear the input and reset the line buffer.
<ESC>[A	Up Arrow	Move up one line in the command history.
<ESC>[B	Down Arrow	Move down one line in the command history.
<ESC>[C	Right Arrow	Position the cursor right one character.
<ESC>[D	Left Arrow	Position the cursor left one character.

Command Tree

The command tree of the CLI begins from the root. The commands in the four extended branches (**config**, **maint**, **perf**, and **show**) are described in Chapter 2, CLI Commands.

There are three additional commands (**login**, **logout**, and **commaDelim**) that are globally available. These commands are described in this chapter. The hierarchy from the root, reading from left to right, is as follows.

Table 1–2: CLI Command Tree

config ----------	features ----------	installKey	
		show	
	ip ----------	ethernet	
		show	
	port ----------	blocked	
		extDist	
		name	
		speed	
		type	
		show	
	security ----------	portBinding -------	bound
			wwn
			show
		userRights --------	administrator
			operator
			show
	snmp ----------	addCommunity	
		authTraps	
		deleteCommunity	
		show	
	switch ----------	bbCredit	
		edTOV	
		interopMode	
		prefDomainId	
		priority	
		raTOV	
		rerouteDelay	
		speed	
		show	
	system ----------	contact	

Table 1–2: CLI Command Tree (Continued)

		date	
		description	
		location	
		name	
		show	
	zoning ----------	setDefZoneState	
		activateZoneSet	
		deactivateZoneSet	
		replaceZoneSet	
		clearZoneSet	
		addZone	
		deleteZone	
		renameZoneSet	
		addWwnMem	
		addPortMem	
		clearZone	
		deleteWwnMem	
		deletePortMem	
		renameZone	
		showPending	
		showActive	
maint ----------	port ----------	beacon	
		reset	
	system ----------	beacon	
		clearSysError	
		ipl	
		resetConfig	
		setOnlineState	
perf ----------	class2		
	class3		

Table 1–2: CLI Command Tree (Continued)

	clearStats		
	errors		
	link		
	traffic		
show ----------	eventLog		
	frus		
	ip ----------	ethernet	
	loginServer		
	nameServer		
	port ----------	config	
		info	
		status	
		technology	
	security ----------	portBinding	
	switch		
	system		
	zoning		

Commands are shown, with the exception of the zoning commands, in alphabetical order to make them easier to locate. Although the commands can be entered in any order, depending on the results desired, the order shown in Table 1–2 on page 1-4 for the zoning commands is a typical order in which the zoning commands are entered.

Note that the order in which commands are entered determines the order in which the show commands display the values. Refer to Chapter 2, CLI Commands for examples of **show** commands output.

Navigation of the CLI Command Tree

Once the administrator or operator logs in and receives the Root> prompt, the CLI commands are accessed by navigating up and down the CLI command tree.

To move from the root through the any of the four extended branches, enter the name of the next branch as shown in Table 1–2 on page 1-4. For example, to use the **config.port.name** command to configure the name for port 4 on the switch, this series of commands is entered:

```
Root> config
Config> port
Config.Port> name 4 "HP Tape Drive"
```

At this point, to enter the **maint.port.beacon** command to set the beaconing state of port 4, the following series of commands is entered:

```
Config.Port> ..
Config> ..
Root> maint
Maint> port
Maint.Port> beacon 4 true
```

NOTE: You must return all the way to the root of the tree to transition to another extended branch. When traversing back to the root, the name of each branch cannot be used. Instead use the double-dot command (two periods) to move back towards the root. Only one double-dot command may be entered at a time.

One approach to making the navigation more concise is to use the root command to jump directly to the root of the CLI command tree. The previous example, which shows stepping back to the root with the double-dot command, is simplified as follows:

```
Config.Port> root
Root> maint
Maint> port
Maint.Port> beacon 4 true
```

Another approach to making the navigation more concise is to use the complete command syntax from the **Root>** prompt each time. For example, to issue the **config.port.name** command and then the **maint.port.beacon** command, the commands are entered as follows:

```
Root> config port name 4 "HP Tape Drive"
Root> maint port beacon 4 true
```

As shown in this example, use of the complete command syntax avoids navigating up and down the branches of the CLI command tree, and the prompt stays at the root. The use of complete command syntax is particularly useful when writing scripts.

When coding a script, remember to code the appropriate character sequences, which are described in Navigation Conventions on page 1-2.

```
Root> config port name 4 "HP Tape Drive"<CR>
Root> maint port beacon 4 true<CR>
```

Limitation on Movements

As the commands are entered, they are recorded in a history log. The limitations on movement that result from use of the history log are:

- If a command has more than 60 characters, the command runs, but the command is not recorded in the history log, and the position in the tree does not change, as shown in the following example. Because the command is not recorded in the history, a subsequent asynchronous command (navigation command) cannot depend on it.

  ```
  Root> config zoning addWwnMem TheUltimateZone
  10:00:00:00:C9:22:9B:64
  Root>
  ```

- Whenever the position in the CLI command tree moves to a new branch (for example, **config** to **maint**, **config** to **config.port**, or **config.port** to **config**), the history log is cleared. In this case, any asynchronous commands (for example, the up-arrow command <ESC>[A or the up-arrow keyboard symbol) cannot move the position back towards the root, as shown in this example:

  ```
  Root> config
  Root.Config> port
  Root.Config.Port> <ESC>[A
  Root.Config.Port>
  ```

Parameters

Some command parameters accept character strings that include spaces. Quotation marks are required when a string includes spaces.

```
Config.System> location Building_24_Room_16
Config.System> location "Building 24 Room 16"
```

If spaces are not included in a parameter that accepts a string, the quotation marks are not required around that string.

To include quotation marks in a string, use the escape character (\) before the quotation marks.

```
Config.System> location "Building 24 \"HP Lab\""
```

A null string can be created by using the quotation marks without any space between them.

```
Config.System> location ""
```

Output

All output from the CLI commands is limited to the standard 80 columns supported by most Telnet interfaces. The output is left-justified.

Logging In and Logging Out

The CLI allows a single Telnet client to be connected to a director or switch. If a Telnet client logs out, or if after 15 minutes of inactivity the client's access times out, another Telnet client may log in. Also note that the Telnet client (user) must log in any time a director or switch is restarted because the current user's access is lost. Examples of a restart include an IPL and any power-off situation.

User Access Rights

The CLI supports two user access rights: **administrator** and **operator**. A user who logs in with administrator access rights can use all of the commands described in this publication. However, operator access rights grant permission to use only the **perf** and **show** branches of the CLI command tree (for example, the **perf.traffic** and **show.system** commands), as well as the globally available commands (**login**, **logout**, and **commaDelim**) described in the following section.

login

Syntax

```
login
```

Purpose

This command allows a Telnet client to connect to a director or switch.

Description

This command allows the user to log in with either administrator or operator access rights. The default passwords are *password*.

The login command is called automatically by the CLI each time a new Telnet session is activated, as well as each time new administrator access rights are configured.

After the login command is issued, the *Username*: prompt automatically displays. After a valid user name is entered, the Password: prompt automatically displays. After the corresponding valid password is entered, the Root> prompt displays. At this prompt the user may enter any of the commands included in Table 1–2 on page 1-4.

A user name and password can be set by the administrator through the config.security.userRights.administrator command or through the config.security.userRights.operator command.

The access rights chosen for the CLI are completely independent of the other product interfaces, for example, SNMP or Hewlett-Packard (HP) product interfaces.

Parameters

This command has no parameters.

Command Examples

```
login
Username: Administrator
Password: password

login
Username: Operator
Password: password
```

logout

Syntax

```
logout
```

Purpose

This command allows a Telnet client to disconnect from a director or switch.

Description

This command logs out the single Telnet client connected to a director or switch. This command can be entered at any point in the command tree.

Parameters

This command has no parameters.

Command Examples

```
Root> logout
Config> logout
Config.Port> logout
```

commaDelim

NOTE: The output examples shown in the other sections of this publication presume that commaDelim is off.

Syntax

```
commaDelim enable
```

Purpose

This command enables the user to obtain displayed information (from a show command) in comma-delimited, rather than tabular, format. Tabular format is the default.

Description

This command can be entered at any point in the command tree.

Parameter

This command has one parameter:

```
enable
```

Specifies the comma-delineated state for output. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> commaDelim true

Config> commaDelim 1

Config.Port> commaDelim false
```

Output Example

Output displayed in commaDelim mode follows.

```
Root> show eventLog

Date/Time,Code,Severity,FRU,Event Data,
04/12/01 10:58A,375,Major,CTP-0,00010203 04050607 08090A0B 0C0D0E0F,
04/12/01 10:58A,375,Major,CTP-0,00010203 04050607 08090A0B 0C0D0E0F,
04/12/01 9:58A,385,Severe,CTP-0,00010203 04050607 08090A0B 0C0D0E0F,
04/11/01 7:18P,395,Severe,CTP-0,00010203 04050607 08090A0B 0C0D0E0F,
```

Handling Command Line Interface Errors

Two types of errors detected by the CLI are:

- An error associated with the interface. For example, a keyword is misspelled or does not exist.

  ```
  Root> confg

  Error 234: Invalid Command
  ```

- An error associated with a fabric, director, or switch. For example, a parameter error is detected by a switch, where port 24 is entered for a switch that supports only 16 ports.

  ```
  Root> config port name 24 "Port 24"

  Error 248: Invalid Port Number
  ```

In either case, the command is ignored. The CLI remains at the point it was before the command was entered. The error messages, including error number and error, are listed in Appendix A, Error Messages.

Using the Command Line Interface Help

The question mark (?) can be used within a command to obtain certain information:

- If the question mark is used in place of a command keyword, all the keywords at that level of the CLI command tree display.

```
Root> config system ?
Command identified
contact           - Set the system contact attribute
date              - Set the system date and time
description       - Set the system description attribute
location          - Set the system location attribute
name              - Set the system name attribute
show              - Display the system configuration
```

- If the question mark is used at the end of a recognized command, any parameters for that command display.

```
Root> config port name ?
                  - name <portNumber> <portName>
```

- If the question mark is used after one or more characters of a keyword, any keywords at that level of the CLI command tree display.

```
Root> config s?
security snmp switch system
```

Commenting Scripts

The pound sign (#) can be used to add comments in a script file. The pound sign must be the first character in the line; the CLI ignores everything after the pound sign in that line. The following lines are valid:

```
Root> #Change port 3 to an E_Port<CR>
Root> config port<CR>
config.port> ##################<CR>
config.port> ## Begin Script ##<CR>
config.port> ##################<CR>
```

The pound sign cannot be used after any other characters (a command, for example) to start a comment. The following is an invalid script line:

```
Root> maint system beacon true # Turn on beaconing<CR>
```

To correct the previous script line, move the comment either before or after the line with the command. For example, the following examples are both valid:

```
Root> # Turn on beaconing<CR>
Root> maint system beacon true<CR>
```

or

```
Root> maint system beacon true<CR>
Root> # Turn on beaconing<CR>
```

Telnet Session

The CLI can only be used through a Telnet client session in an out-of-band management environment, using the Ethernet port in a director or switch. Although the primary use of the CLI is in host-based scripting environments, the CLI commands can also be entered directly at a command line. Any hardware platform that supports the Telnet client software can be used.

NOTE: If you have the HAFM application, use the Configure option in the software to enable Telnet access before attempting to establish a Telnet client session. You can also enable Telnet access by using the Configure option of the Embedded Web Server (EWS).

Ethernet Connection Loss

If the Ethernet cable is disconnected from a director or switch during a Telnet session, one of three scenarios is possible:

- Replace the Ethernet cable before the client connection times out, and the Telnet session will continue.
- Wait 15 minutes for the client connection times out; then replace the Ethernet cable and restart the connection.
- If the client connection has already timed out, replace the Ethernet cable. Open an EWS or HAFM application window. Toggle the enabled state of the CLI, thereby clearing the client connection. Restart the client connection.

Once the client connection is reestablished, verify your configuration's completeness and accuracy.

2

CLI Commands

This chapter describes command line interface (CLI) commands, including their syntax, purpose, and parameters, as well as examples of their usage and any output that they generate.

Command Overview

Most of the commands in this chapter are listed in alphabetical order to make them easy to locate. Although the commands can be entered in any order, depending on the results desired (so long as the tree structure is followed), the order used herein for the zoning commands follows a typical order of entry. The various show commands are usually entered at the end of a group of other commands.

config Commands

The config branch of the CLI command tree contains commands that set parameter values. These values are not temporary (session) values, but are retained across power cycles. The commands in the config branch can by used only by the administrator.

Note that the **config.zoning** commands function in a different way from the other CLI commands, which are single action commands that take effect immediately. A zoning configuration is typically too complicated to be described by a single command, so the

first zoning command entered invokes a work-area editor. The commands take effect on a temporary copy of a zone set in the work area until the temporary copy in the work area is activated to the fabric or is discarded.

Because not all the verification of the zone set can occur on the temporary copy in the work area, it is possible, however unlikely, that the copy of the zone set encounters no errors until the zone set is activated to the fabric.

config.features.installKey

Syntax

```
installKey "featureKey"
```

Purpose

This command allows the user to install a feature set that is enabled by the provided feature key.

Description

The switch must be offline to install a feature key. After the key is installed, you must IPL the switch; the connection to the CLI will be lost at this time and must be re-established.

Parameters

This command has one parameter.

featureKey	Specifies the key you have received to enable an optional software feature on a specific product. A feature key is a string of case-sensitive, alphanumeric ASCII characters. The number of characters may vary in the format; however, the key must be entered exactly, including the hyphens. An example of a feature key format is XxXx-XXxX-xxXX-xX.

Command Example

```
Root> config features installKey AaBb-CCdD-eeFF-gH
```

config.features.show

Syntax

```
show
```

Purpose

This command shows the product feature information configured for this switch.

Parameters

This command has no parameters.

Command Example

```
Root> config features show
```

Output

The product feature data is displayed as a table that includes the following property.

Features	The list of features supported for the feature key.

Output Example

The output from the config.ip.show command displays as follows.

```
Features: Open Systems Management Server
          8 Flex Ports
```

config.ip.ethernet

Syntax

```
ethernet ipAddress gatewayAddress subnetMask
```

Purpose

This command sets the Ethernet network settings.

Description

The Telnet connection can be lost when these Ethernet network settings are changed.

If the IP address is reconfigured, your Telnet client must be reconnected to the new IP address. A new login will be requested.

Parameters

This command has three parameters.

ipAddress	Specifies the new IP address for the director 2/64, edge switch 2/16, or edge switch 2/32. The address must be entered in dotted decimal format (for example, 10.0.0.0).
gatewayAddress	Specifies the new gateway address for the Ethernet interface. The address must be entered in dotted decimal format (for example, 0.0.0.0).
subnetMask	Specifies the new subnet mask for the Ethernet interface. The address must be entered in dotted decimal format (for example, 255.0.0.0).

Command Example

```
Root> config ip ethernet 10.0.0.0 0.0.0.0 255.0.0.0
```

config.ip.show

Syntax

```
show
```

Purpose

This command shows the LAN configuration.

Parameters

This command has no parameters.

Command Example

```
Root> config ip show
```

Output

The LAN configuration data is displayed as a table that includes the following properties.

IP Address	The IP address.
Gateway Address	The gateway address.
Subnet Mask	The subnet mask.

Output Example

The output from the **config.ip.show** command displays as follows.

```
IP Address:         10.0.0.0
Gateway Address:    0.0.0.0
Subnet Mask:        255.0.0.0
```

config.port.blocked

Syntax

```
blocked portNumber blockedState
```

Purpose

This command sets the blocked state for a port.

Parameters

This command has two required parameters.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64
blockedState	Specifies the blocked state for the port. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config port blocked 4 false
Root> config port blocked 4 0
```

config.port.extDist

Syntax

```
extDist portNumber extDistOn
```

Purpose

This command sets the extended distance state for a port.

Description

When the extended distance field is *true*, the port is configured for 60 buffer credits, which supports a distance of up to 100 km for a 2.125 gigabit per second (Gbps) port.

Parameters

This command has two required parameters:

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64
extDistOn	Specifies the extended distance state for the port. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config port extDist 4 false
Root> config port extDist 4 0
```

config.port.name

Syntax

```
name portNumber "portName"
```

Purpose

This command sets the name for a port.

Parameters

This command has two required parameters:

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64
portName	Specifies the name for the port. The port name must not exceed 24 characters in length.

Command Example

```
Root> config port name 4 "HP Tape Drive"
```

config.port.speed

Syntax

```
speed portNumber portSpeed
```

Purpose

This command sets the speed for a port.

Description

A port can be configured to operate at 1.0625 Gbps, 2.125 Gbps, or a negotiated speed.

The port speed can be set only to 1.0625 Gbps if the switch speed is 1.0625 Gbps. An attempt to set the port speed to 2.125 Gbps or to negotiate in a switch with a 1.0625 Gbps switch speed results in an error message.

If the port speed is set to negotiate, the port and the device to which it is attached negotiate the data speed setting to either 1.0625 or 2.125 Gbps.

NOTE: Port speed changes temporarily disrupt port data transfers.

Parameters

This command has two required parameters.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64
portSpeed	Specifies the speed of the port. Valid values are *1g*, *2g*, and *negotiate*.

Command Examples

```
Root> config port speed 4 2g
Root> config port speed 6 negotiate
```

config.port.type

Syntax

```
type portNumber portType
```

Purpose

This command sets the allowed type for a port.

Description

A port can be configured as an F_Port, an E_Port, or a G_Port. If a port is configured as an F_Port, that port cannot be used as an interswitch link, but may attach to a device with an N_Port. If a port is configured as an E_Port, only other switches may attach to that port. If a port is configured as a G_Port, either a device or another switch may attach.

Parameters

This command has two required parameters:

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64
portType	Specifies the type of the port. Valid values are *eport*, *fport*, and *gport*.

Command Example

```
Root> config port type 4 fport
```

config.port.show

Syntax

```
show portNumber
```

Purpose

This command displays the port configuration for a single port.

Description

This show command, on the config.port branch, displays the current configuration for the specified port.

Parameters

This command has one parameter:

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> config port show 4
```

Output

The port configuration is displayed as a table that includes the following properties.

Port Number	The port number.
Name	The port name.
Blocked	The blocked state. Valid values are *true* and *false*.
Extended Distance	The extended distance configuration state. Valid values are *true* and *false*.
Type	The port type. Valid values are *F Port*, *E Port*, and *G Port*.

Speed — The port speed. Valid values are *1 Gb/sec*, *2 Gb/sec*, and *Negotiate*.

Output Example

The output from the config.port.show command displays as follows.

```
Port Number:         4
Name:                HP4 tape drive
Blocked:             false
Extended distance:   false
Type:                F Port
Speed:               2 Gb/sec
```

config.security.portBinding
config.security.portBinding.bound

Syntax

```
bound portNumber portBindingState
```

Purpose

This command sets the port binding state for a given port.

Parameters

This command has two parameters:

portNumber — Specifies the port number for which the port binding state is being set. Valid port number values are:

0–15 for the edge switch 2/16

0–31 for the edge switch 2/32

0–63 for the director 2/64

portBindingState — Specifies the port binding state as active or inactive. Valid values are *true* and *false*.

true sets the port binding to active. The specified port will be bound to the WWN configured with the config.security.portBinding.wwn command. If no WWN has been configured, no devices can log in to that port.

false sets the port binding to inactive. Any device is free to connect to the specified port in this state, regardless of the WWN setting.

Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config security portBinding bound 4 true
Root> config security portBinding bound 4 1
```

config.security.portBinding.wwn

Syntax

```
wwn portNumber boundWwn
```

Purpose

This command configures the single device WWN to which a port is bound.

Parameters

This command has two parameters.

portNumber — Specified the port number for which the bound WWN is being set.
Valid port number values are:

0–15 for the edge switch 2/16

0–31 for the edge switch 2/32

0–63 for the director 2/64

boundWwn — Specifies the WWN of the device that is being bound to the specified port. The value must be entered in colon-delimited hexidecimal notation (for example, 11:22:33:44:55:66:AA:BB).

If the boundWwn is configured and the portBindState is:

Active—only the device described by boundWwn will be able to connect to the specified port.

Inactive—the WWN is retained, but any device can connect to the specified port.

Instead of the WWN, either of two values can be entered in this parameter:

attached automatically configures the currently attached device WWN as the bound WWN.

remove changes the WWN to the default value, 00:00:00:00:00:00:00:00. Even though this removes the WWN-port association, if the portBindingState value set with the config.security.portBinding.bound command is still *true* (the port binding is active), other devices are prevented from logging in to this port. To allow other devices to log in to this port, use the config.security.portBinding.bound command to set the portBindingState parameter to false.

Command Examples

```
Root> config security portBinding wwn 4 AA:99:23:23:08:14:88:C1
Root> config security portBinding wwn 4 attached
Root> config security portBinding wwn 4 remove
```

config.security.portBinding.show

Syntax

```
show portNumber
```

Purpose

This command shows the port binding configuration for a single port.

Parameters

This command has one parameter.

portNumber	Specifies the port number for which the port binding configuration will be shown. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> config security portBinding show 4
```

Output

The port binding configuration date is displayed as a table that includes the following properties.

Port Number	The port number.
WWN Binding	The state of port binding for the specified port, either active or inactive.
Bound WWN	The WWN of the device that is bound to the specified port. If this field is blank, no device has been bound to the specified port.

Output Example

The output from the config.security.portBinding.show command displays as follows.

```
Port Number:          4
WWN Binding:          Active
Bound WWN:            AA:99:23:23:08:14:88:C1
```

config.security.userRights
config.security.userRights.administrator

Syntax

```
administrator "username" "password"
```

Purpose

This command sets the name and password for administrator-level access.

Description

Immediately after the name and password for the administrator is set, you will be prompted to log in with the new access rights.

Parameters

This command has two parameters:

username — Specifies the new user name for administrator-level login.

Default is set to *Administrator*.

This parameter is 1–15 characters.

Valid characters include all characters in the USASCII character set, excluding control characters and spaces.

Spaces are not valid even though quotation marks are used.

password — Specifies the password for administrator-level login.

Default is set to *password*.

This parameter is 1–15 characters.

Valid characters include all characters in the USASCII character set, excluding control characters and spaces.

Spaces are not valid even though quotation marks are used.

Command Example

```
Root> config security userRights administrator "Administrator"
"newpassword"
```

config.security.userRights.operator

Syntax

```
operator "username" "password"
```

Purpose

This command sets the name and password for operator-level access.

Parameters

This command has two parameters.

username — Specifies the new user name for operator-level login.

Default is *Operator*.

This parameter is 1–15 characters.

Valid characters include all characters in the USASCII character set, excluding control characters and spaces.

Spaces are not valid even though quotation marks are used.

password	Specifies the password for operator-level login. Default is *password*. This parameter is 1–15 characters. Valid characters include all characters in the USASCII character set, excluding control characters and spaces. Spaces are not valid even though quotation marks are used.

Command Example

```
Root> config security userRights operator "Operator" "newpassword"
```

config.security.userRights.show

Syntax

```
show
```

Purpose

This command shows the user rights for the CLI access levels.

Parameters

This command has no parameters.

Command Example

```
Root> config security userRights show
```

Output

The user rights configuration data is displayed as a table that includes the following properties.

Operator Username	The username for operator privileges.
Operator Password	The password for operator privileges.
Administrator Username	The username for administrator privileges.

Administrator Password	The password for administrator privileges.

Output Example

The output from the config.security.userRights.show command displays as follows.

```
Operator Username: Operator
Operator Password: **************
Administrator Username: Administrator
Administrator Password: ***************
```

config.snmp.addCommunity

Syntax

```
addCommunity commIndex "commName" writeAuthorization trapRecipient
udpPortNum
```

Purpose

This command adds an SNMP community to the SNMP configuration.

Parameters

This command has five parameters. Up to six community names and trap recipients may be defined.

commIndex	Specifies the community to be created or edited. Valid values are integers in the range 1–6.
commName	Specifies the community name of the community specified by commIndex. The community name must not exceed 32 characters in length. Valid characters include all those in the ISO Latin-1 character set. Duplicate community names are allowed, but the corresponding writeAuthorization values must match.
writeAuthorization	Specifies the write authorization state of the community. Valid values are *enabled* and *disabled*. Boolean 1 and 0 may be substituted as values.

trapRecipient	Specifies the trap recipient. Values must be 4 bytes in dotted-decimal format.
udpPortNum	Specifies the user datagram protocol (UDP) port number to which the director will send traps for each recipient. The value must be a decimal number; the default value is 162. Valid values include all legal UDP port numbers.

Command Example

```
Root> config snmp addCommunity 1 "CommunityName1" enabled
123.123.123.123 162
```

config.snmp.authTraps

Syntax

```
authTraps enabledState
```

Purpose

This command enables or disables the authorization traps to be sent to SNMP management stations when unauthorized stations try to access SNMP information from the director or switch.

Parameters

This command has one parameter.

enabledState	Specifies whether the authorization traps are enabled. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config snmp authTraps true
Root> config snmp authTraps 1
```

config.snmp.deleteCommunity

Syntax

```
deleteCommunity commIndex
```

Purpose

This command entirely deletes a community from the SNMP.

Parameters

This command has one parameter.

commIndex — Specifies the community to be deleted.

Valid values are integers in the range 1–6.

This value was set in the commIndex parameter of the **config.snmp.addCommunity** command.

Valid values are integers in the range 1–6.

Command Example

```
Root> config snmp deleteCommunity 5
```

config.snmp.show

Syntax

```
show
```

Purpose

This command shows the switch SNMP configuration.

Parameters

This command has no parameters.

Command Example

```
Root> config snmp show
```

Output

The switch configuration data is displayed as a table that includes the following properties.

Authorization Traps	The state of the authorization traps (for example, enabled) that will be sent to SNMP management stations when unauthorized stations attempt to access SNMP information from the switch.
Index	The community index number.
Community Name	The name of the community.
writeAuth	The write authorization state.
Trap Recipient	The address of the trap recipient.
UDP Port	The user datagram protocol (UDP) port number to which the director will send traps for each recipient.

Output Example

The output from the config.snmp.show command displays as follows.

```
Authorization Traps: Enabled
Index Community Name                 WriteAuth Trap Recipient  UDP Port
----- ------------------------------ --------- --------------- --------
1     CommunityName1                   Enabled   123.123.123.123 162
2     CommunityName2                   Enabled   10.25.25.10     144
3     CommunityName3                   Disabled  132.44.85.224   162
4     public                           Enabled                   162
5
6
```

config.switch Commands

All of the **config.switch** commands, except for the **config.switch.show** command, require that the switch be set offline. (Use the maint.system.setOnlineState to set the switch offline.) If these commands are entered while the switch is online, an error message results.

config.switch.bbCredit

Syntax

```
bbCredit bbCreditValue
```

Purpose

This command sets the buffer-to-buffer credit value for all ports, except those ports configured for extended distance.

Description

The switch must be set offline before this command is entered.

Parameters

This command has one parameter.

bbCreditValue	Specifies the new buffer-to-buffer credit value. This parameter must be an integer in the range 1–60.

Command Example

```
Root> config switch bbCredit 2
```

config.switch.edTOV

Syntax

```
edTOV timeoutValue
```

Purpose

This command sets the E_D_TOV for the switch.

Description

The switch must be set offline before this command is entered.

Special care should be used when scripting this command due to its relationship with R_A_TOV.

Parameters

This command has one parameter:

timeoutValue — Specifies the new E_D_TOV value.

The units for this value are tenths of a second.

This parameter must be an integer in the range 2–600 (0.2 second to 60 seconds), and it must be smaller than the R_A_TOV.

Command Example

```
Root> config switch edTOV 4
```

config.switch.interopMode

Syntax

```
interopMode
```

Purpose

This command sets the interoperability mode for the switch.

Description

The switch must be set offline before this command is entered.

Parameters

This command has one parameter.

interopMode — Specifies the interoperability mode.

Valid values are:

- *Homogenous Fabric*
- *Open Fabric 1.0*

Command Example

```
Root> config switch interopMode open
```

config.switch.prefDomainId

Syntax

```
prefDomainId domainId
```

Purpose

This command sets the preferred domain ID for the switch.

Description

The switch must be set offline before this command is entered.

Parameters

This command has one parameter.

domainId	Specifies the new preferred domain ID value. This parameter must be an integer in the range 1–31.

Command Example

```
Root> config switch prefDomainId 1
```

config.switch.priority

Syntax

```
priority switchPriority
```

Purpose

This command sets the switch priority.

Description

The switch must be set offline before this command is entered.

Parameters

This command has one parameter:

switchPriority — Specifies the switch priority.

Valid values are: *principal*, *default*, or *neverprincipal*.

- *principal* — sets the numerical switch priority to 1. The switch with a priority of 1 becomes the principal switch; however, if two or more switches have a priority of 1, the switch with the lowest WWN becomes the principal switch.
- *default* — sets the numerical switch priority to 254. If no switch is set to principal, the switch with a priority 254 becomes the principal switch; however, if two or more switches have a priority of 254, the switch with the lowest WWN becomes the principal switch.
- *neverprincipal* — sets the numerical switch priority to 255. This switch is not able to become the principal switch.

NOTE: At least one switch in a multiswitch fabric must have a switch priority value of principal or default.

NOTE: The number codes 2–253 are not now in use.

Command Example

```
Root> config switch priority principal
```

config.switch.raTOV

Syntax

```
raTOV timeoutValue
```

Purpose

This command sets the R_A_TOV for the switch.

Description

The switch must be set offline before this command is entered.

Special care should be used when scripting this command due to its relationship with E_D_TOV.

Parameters

This command has one parameter:

timeoutValue — Specifies the new R_A_TOV value.

The units for this value are tenths of a second.

This parameter must be an integer in the range 10–1200 (1 second to 120 seconds), and must be larger than the E_D_TOV.

Command Example

```
Root> config switch raTOV 20
```

config.switch.rerouteDelay

Syntax

```
rerouteDelay rerouteDelayState
```

Purpose

This command enables or disables rerouting delay for the switch.

Description

The switch must be set offline before this command is entered.

This command is only applicable if the configured switch is in a multiswitch fabric. Enabling the rerouting delay ensures that frames are delivered in order through the fabric to their destination.

If there is a change to the fabric topology that creates a new path (for example, a new switch is added to the fabric), frames may be routed over this new path if its hop count is less than a previous path with a minimum hop count. This may result in frames being delivered to a destination out of order because frames sent over the new, shorter path may arrive ahead of older frames still in route over the older path.

If rerouting delay is enabled, traffic ceases in the fabric for the time specified in the config.switch.edTOV command. This delay allows frames sent on the old path to exit to their destination before new frames begin traversing the new path. Note that during this delay period, frames addressed to the destinations that are being rerouted are discarded if they are Class 3 frames and rejected if they are Class 2 or Class F frames.

Parameter

This command has one parameter.

rerouteDelayState Specifies whether rerouting delay is enabled.

Valid values are *true* and *false*.

Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config switch rerouteDelay true
Root> config switch rerouteDelay 1
```

config.switch.speed

Syntax

```
speed switchSpeed
```

Purpose

This command sets the speed for the switch.

Description

The switch must be set offline before this command is entered.

A switch can be configured to operate at 1.0625 or 2.125 Gbps.

If the switch has fibre port module (FPM) cards, configuring the switch speed to 2.125 Gbps makes all the ports on the FPM cards inactive, and their operational state will be set to inactive. FPM ports do not support 2.125 Gbps and, therefore, will remain inactive after the switch is returned to the online state.

Parameters

This command has one required parameter.

switchSpeed	Specifies the speed of the switch. Valid values are *1g* (for 1 Gbps) or *2g* (for 2 Gbps).

Command Examples

```
Root> config switch speed 2g
```

config.switch.show

Syntax

```
show
```

Purpose

This command shows the switch configuration.

Parameters

This command has no parameters.

Command Example

```
Root> config switch show
```

Output

The switch configuration data is displayed as a table that includes the following properties.

BB Credit	The maximum number of outstanding frames that can be transmitted without causing a buffer overrun condition at the receiver.
R_A_TOV	Resource Allocation Time Out Value. This value is set in tenths of a second.
E_D_TOV	Error Detect Time Out Value. This value is set in tenths of a second.
Preferred Domain Id	The preferred domain ID of the switch.
Switch Priority	The switch priority. Values are Principal, Default, or Never Principal.
Speed	The switch speed.
Rerouting Delay	The rerouting delay that ensures that frames are delivered in order through the fabric to their destination. Values are Enabled or Disabled.
Interop Mode	Interoperability mode for the switch.

Output Example

The output from the config.switch.show command displays as follows.

```
BB Credit:           2
R_A_TOV:             20
E_D_TOV:             4
Preferred Domain Id: 1
Switch Priority:     Principal
Speed:               2 Gb/sec
Rerouting Delay:     Enabled
Interop Mode:        Open Fabric 1.0
```

config.system.contact

Syntax

```
contact "systemContact"
```

Purpose

This command sets the system contact attribute.

Parameters

This command has one parameter.

systemContact	Specifies the new system contact string for the director or switch. The contact can contain 0–255 characters.

Command Example

```
Root> config system contact "Joe"
```

config.system.date

Syntax

```
date sysDate sysTime
```

Purpose

This command sets the system date and time.

Parameters

This command has two required parameters:

sysDate — Specifies the new system date.

The format of the date parameter must be mm:dd:yyyy or mm/dd/yyyy.

Valid date values include:

- mm: 1–12
- dd: 1–31
- yyyy: >1980

sysTime — Specifies the new system time.

The format of the time parameter must be hh:mm:ss.

Valid time values include:

- hh: 0–23
- mm: 0–59
- ss: 0–59

Command Examples

```
Root> config system date 04:16:2001 10:34:01
Root> config system date 10/09/2001 14:07:55
```

config.system.description

Syntax

```
description “systemDescription”
```

Purpose

This command sets the system description string.

Parameters

This command has one parameter.

systemDescription	Specifies the new system description string for the director or switch. The name can contain 0–255 characters.

Command Example

```
Root> config system description "hp StorageWorks director 2/64"
```

config.system.location

Syntax

```
location "systemLocation"
```

Purpose

This command sets the system location attribute.

Parameters

This command has one parameter.

systemLocation	Specifies the new system location for the director or switch. The location can contain 0–255 characters.

Command Example

```
Root> config system location "Everywhere"
```

config.system.name

Syntax

```
name "systemName"
```

Purpose

This command sets the system name attribute.

Parameters

This command has one required parameter.

systemName	Specifies the new system name for the director or switch. The name can contain 0–24 characters.

Command Example

```
Root> config system name "hp edge switch 2/16"
```

config.system.show

Syntax

```
show
```

Purpose

This command shows the system configuration.

Parameters

This command has no parameters.

Command Example

```
Root> config system show
```

Output

The system configuration is displayed as a table that includes the following properties.

Name	The system name.
Description	The system description.
Contact	The system contact.

Location	The system location.
Date/Time	The system date and time.

Output Examples

The output from the config.system.show command displays as follows.

```
Name:               hp director
Description:        hp StorageWorks director 2/64
Contact:            Joe
Location:           Everywhere
Date/Time:          04/16/2001 10:34:01
```

config.zoning Commands

Note that the **config.zoning** commands function in a different way from the other CLI commands, which are single action commands that take effect immediately. A zoning configuration is typically too complicated to be described by a single command, so the first zoning command entered invokes a work-area editor. The commands take effect on a temporary copy of a zone set in the work area until the temporary copy in the work area is activated to the fabric--or is discarded.

Because not all the verification of the zone set can occur on the temporary copy in the work area, it is possible, however unlikely, that the copy of the zone set encounters no errors until the zone set is activated to the fabric.

config.zoning.setDefZoneState

Syntax

```
setDefZoneState defaultZoneState
```

Purpose

This command enables or disables the default zone and takes effect immediately fabric wide.

Description

This command takes effect immediately in the fabric.

Parameters

This command has one parameter.

defaultZoneState — Specifies whether the default zone is enabled.

Valid values are *true* and *false*.

Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config zoning setDefZoneState false
Root> config zoning setDefZoneState 0
```

config.zoning.activateZoneSet

Syntax

```
activateZoneSet
```

Purpose

This command activates the zone set contained in the work area to the fabric and takes effect immediately.

Description

This command takes effect immediately in the fabric.

Parameters

This command has no parameters.

Command Example

```
Root> config zoning activateZoneSet
```

config.zoning.deactivateZoneSet

Syntax

```
deactivateZoneSet
```

Purpose

This command places all attached devices in the default zone and takes effect immediately fabric wide.

Description

The default zone must be activated independently of this command.

NOTE: This command takes effect immediately in the fabric.

Parameters

This command has no parameters.

Command Example

```
Root> config zoning deactiveZoneSet
```

config.zoning.replaceZoneSet

Syntax

```
replaceZoneSet
```

Purpose

This command replaces the work area with the active zone set that is currently loaded on the fabric.

Parameters

This command has no parameters.

Command Example

```
Root> config zoning replaceZoneSet
```

config.zoning.clearZoneSet

Syntax

```
clearZoneSet
```

Purpose

This command clears the zone set contained in the work area, removing all zones, and takes effect immediately.

Description

This command does not change the zone set name.

Parameters

This command has no parameters.

Command Example

```
Root> config zoning clearZoneSet
```

config.zoning.addZone

Syntax

```
addZone “zoneName”
```

Purpose

This command adds a new (empty) zone to the zone set in the work area.

Description

Changes are not activated on the switch until the config.zoning.activateZoneSet command is issued. The CLI supports the number of zones per zone set specified for a given product.

Parameters

This command has one parameter.

zoneName Specifies the name of the new zone.

The zoneName must contain 1–64 characters.

Valid characters are:

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrs tuvwxyz0123456789$-^_

Spaces are not permitted, and the first character must be alphabetical.

Command Example

```
Root> config zoning addZone TheUltimateZone
```

config.zoning.deleteZone

Syntax

```
deleteZone "zoneName"
```

Purpose

This command deletes a zone from the zone set in the work area.

Description

Changes are not activated on the switch until the config.zoning.activeZoneSet command is issued.

Parameters

This command has one parameter.

zoneName Specifies the name of the zone to be deleted.

Command Example

```
Root> config zoning deleteZone TheLeastUltimateZone
```

config.zoning.renameZoneSet

Syntax

```
renameZoneSet "zoneSetName"
```

Purpose

This command changes the name of the zone set in the work area.

Description

Changes are not activated on the switch until the config.zoning.activateZoneSet command is issued.

Parameters

This command has one parameter.

zoneSetName — Specifies the new name for the zone set.

The zoneSetName must contain 1–64 characters.

Valid characters are:

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789$-^_

Spaces are not permitted, and the first character must be alphabetical.

Command Example

```
Root> config zoning renameZoneSet TheUltimateZoneSet
```

config.zoning.addWwnMem

Syntax

```
addWwnMem “zoneName” wwn
```

Purpose

This command adds a world-wide name zone member to the specified zone in the work area.

Description

The CLI supports the number of zones members per zone specified for a given product.

Parameters

This command has two parameters.

zoneName	Specifies the name of the zone.
wwn	The world-wide name of the member to be added to the zone. The value of the WWN must be in colon-delimited hexadecimal notation. For example: AA:00:AA:00:AA:00:AA:00.

Command Example

```
Root> config zoning addWwnMem TheUltimateZone
10:00:00:00:C9:22:9B:64
```

config.zoning.addPortMem

Syntax

```
addPortMem “zoneName” domainId portNumber
```

Purpose

This command adds the domain ID and port number of a zone member to the specified zone in the work area.

Description

The CLI supports the number of zones members per zone specified for a given product.

Parameters

This command has one parameter.

zoneName	Specifies the name of the zone.
domainId	Specifies the domain ID of the member to be added to the zone. Valid values are in the range 1–31.
portNumber	Specifies the port number of the member to be added to the zone. Valid port number values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> config zoning addPortMem TheUltimateZone 10 6
```

config.zoning.clearZone

Syntax

```
clearZone "zoneName"
```

Purpose

This command clears all zone members for the specified zone in the work area.

Description

This command does not change the zone name.

Parameters

This command has one parameter.

zoneName	Specifies the name of the zone to be cleared.

Command Example

```
Root> config zoning clearZone TheNotUltimateAtAllZone
```

config.zoning.deleteWwnmem

Syntax

```
deleteWwnMem "zoneName" wwn
```

Purpose

This command removes a WWN member from a zone that is in the work area.

Parameters

This command has two parameters.

zoneName	Specifies the name of the zone that contains the member to be deleted.

wwn	Specifies the world-wide name of the member to be deleted from the zone. The value of the WWN must be in colon-delimited hexidecimal notation. For example: AA:00:AA:00:AA:00:AA:00.

Command Example

```
Root> config zoning deleteWwnMem TheNotSoUltimateZone
10:00:00:00:C9:22:9B:AB
```

config.zoning.deletePortMem

Syntax

```
deletePortMem “zoneName” domainId portNumber
```

Purpose

This command deletes a domain ID and port number for a zone member in the specified zone in the work area.

Parameters

This command has three parameters.

zoneName	Specifies the name of the zone that contains the member to be deleted.
domainId	Specifies the domain ID of the member that to be deleted from the zone. Valid domain IDs are in the range 1–31.
portNumber	Specifies the port number of the member to be deleted from the zone. Valid port numbers values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> config zoning deletePortMem TheUltimateZone 10 5
```

config.zoning.renameZone

Syntax

```
renameZone "oldZoneName" "newZoneName"
```

Purpose

This command renames a zone in the work area.

Parameters

This command has two parameters.

oldZoneName	Specifies the current zone name of the zone to be renamed.
newZoneName	Specifies the new zone name. The newZoneName must contain 1–64 characters. Valid characters are: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz$-^_ Spaces are not permitted, and the first character must be alphabetical.

Command Example

```
Root> config zoning renameZone TheOldUltimateZone TheUltimateZone
```

config.zoning.showPending

Syntax

```
showPending
```

Purpose

This command shows the zoning configuration in the work area of the zone set that has not yet been activated.

Parameters

This command has no parameters.

Command Example

```
Root> config zoning showPending
```

Output

The zoning configuration data is displayed as a table that includes the following properties.

Local ZoneSet	The enabled status, name, and member zones of the zone set.

Output Example

The output from the config.zoning.showPending command displays as follows.

```
Pending Zone Set
Default Zone Enabled:  False
ZoneSet:  TheNewUltimateZoneSet
    Zone:  TheNewUltimateZone
           ZoneMember: Domain 10, Port 6
           ZoneMember: Domain 15, Port 2
    Zone:  TheNewNotSoUltimateZone
           ZoneMember: 10:00:00:00:C9:22:9B:AB
           ZoneMember: 10:00:00:00:C9:22:9B:C6
           ZoneMember: 10:00:00:00:C9:22:9B:AB
    Zone:  TheNewNotUltimateAtAllZone
          ZoneMember: Domain 2, Port 63
```

config.zoning.showActive

Syntax

```
showActive
```

Purpose

This command shows the zoning configuration saved on the fabric.

Parameters

This command has no parameters.

Command Example

```
Root> config zoning showActive
```

Output

The zoning configuration data is displayed as a table that includes the following properties.

Active ZoneSet	The enabled status, name, and member zones of the zone set.

Output Example

The output from the config.zoning.showActive command displays as follows.

```
Active Zone Set
Default Zone Enabled:  False
ZoneSet:  TheUltimateZoneSet
    Zone:  TheUltimateZone
           ZoneMember: Domain 10, Port 6
           ZoneMember: Domain 15, Port 2
           ZoneMember: Domain 2, Port 63
           ZoneMember: 10:00:00:00:C9:22:9B:64
           ZoneMember: 10:00:00:00:C9:22:9B:BD
    Zone:  TheNotSoUltimateZone
           ZoneMember: 10:00:00:00:C9:22:9B:AB
           ZoneMember: 10:00:00:00:C9:22:9B:C6
           ZoneMember: 10:00:00:00:C9:22:9B:AB
    Zone:  TheNotUltimateAtAllZone
           ZoneMember: Domain 2, Port 63
```

maint Commands

The maint branch of the CLI command tree contains commands that relate to maintenance activities.

The commands in the maint branch can be used only by the administrator.

Note that the maint.system.resetConfig command resets all configuration data and non-volatile settings, including network information, to their default values (factory settings). Management access may be lost until the network information is restored.

maint.port.beacon

Syntax

```
beacon portNumber beaconState
```

Purpose

This command enables or disables port beaconing for a port.

Parameters

This command has two required parameters.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64
beaconState	Specifies whether unit beaconing is enabled. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> maint port beacon 4 false
Root> maint port beacon 4 0
```

maint.port.reset

Syntax

```
reset portNumber
```

Purpose

This command resets a port.

Description

This command resets an individual port without affecting any other ports. However, if a device is attached to the port and the device is online, the reset causes a link reset to occur. If the port is in a failed state (that is, after failing a loopback test), the reset restores the port to an operational state. The reset also clears all statistics counters and disables port beaconing for the specified port.

Parameters

This command has one parameter.

portNumber	Specifies the port number to be reset. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> maint port reset 4
```

maint.system.beacon

Syntax

```
beacon beaconState
```

Purpose

This command enables or disables unit beaconing.

Parameters

This command has one parameter.

beaconState	Specifies whether unit beaconing is enabled. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> maint system beacon false
Root> maint system beacon 0
```

maint.system.clearSysError

Syntax

```
clearSysError
```

Purpose

This command clears the system error light.

Parameters

This command has no parameters.

Command Example

```
Root> maint system clearSysError
```

maint.system.ipi

Syntax

```
ipl
```

Purpose

This command IPLs the switch.

Description

Connection to the command line interface is lost when this command runs.

Parameters

This command has no parameters.

Command Example

```
Root> maint system ipl
```

maint.system.resetConfig

Syntax

```
resetConfig
```

Purpose

This command resets all NV-RAM configuration parameters to their default values, including feature keys and IP addresses.

Description

This command IPLs the switch. Connection from the CLI to the switch is lost when this command runs.

NOTE: This command resets all configuration data and non-volatile settings, including network information, to their default values (factory settings). Management access may be lost until the network information is restored.

The default values are set in the firmware of the director or switch. For information about the default values, refer to the service manual for your director or switch.

Parameters

This command has no parameters.

Command Example

```
Root> maint system resetConfig
```

maint.system.setOnlineState

Syntax

```
setOnlineState onlineState
```

Purpose

This command sets the switch online or offline.

Parameters

This command has one parameter.

onlineState	Specifies whether the switch is online. Valid values are *true* and *false*. Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> maint system setOnlineState true
Root> maint system setOnlineState 1
```

perf Commands

The perf branch of the CLI command tree contains commands that relate to performance services.

The commands in the perf branch can by used by either the administrator or the operator.

Note that the counters in perf command output are 32-bit values that wrap at 4,294,967,296. To calculate the full value of a counter, multiply 4,294,967,296 by the value in the wrap field, and add the resulting product to the value in the count field. For example, if a TxFrames statistic has a count value of 1842953 and a wrap value of 12, the full value of the counter is:

(4,294,967,296 x 12) + 1842953 = 51,541,450,505.

perf.class2

Syntax

```
class2 portNumber
```

Purpose

This command displays port Class 2 counters for a single port.

Parameters

This command has one parameter.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> perf class2 2
```

Output

The port Class 2 counter data is displayed as a table that includes the following statistics, along with a wrap count for each corresponding counter.

Port	The port number.
RxFrames	The number of Fibre Channel Class 2 frames that the port has received.

TxFrames	The number of Fibre Channel Class 2 frames that the port has transmitted.
RxWords	The number of Class 2 4-byte words within frames that the port has received.
TxWords	The number of Class 2 4-byte words within frames that the port has transmitted.
Busied Frms	The number of times that FBSY (Fabric Busy link response) was returned to this port as a result of a Class 2 frame that could not be delivered to the other end of the link. This occurs if either the fabric or the destination port is temporarily busy.
Rjct Frames	The number of times that FRJT (Frame Reject link response) was returned to this port as the result of a Class 2 frame that was rejected by the fabric.

Output Example

The output from the perf.class2 command displays as follows.

```
Port 2
Statistic   Count      Wrap
----------- ---------- ----------
RxFrames    2953184    23
TxFrames    1842953    12
RxWords     2943184    65
TxWords     1842953    32
Busied Frms 2953184    0
Rjct Frames 1842953    0
```

perf.class3

Syntax

```
class3 portNumber
```

Purpose

This command displays port Class 3 counters for a single ports.

Parameters

This command has one parameter.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> perf class3 2
```

Output

The port Class 3 counter data is displayed as a table that includes the following statistics, along with a wrap count for each corresponding counter.

Port	The port number.
RxFrames	The number of Fibre Channel Class 3 frames that the port has received.
TxFrames	The number of Fibre Channel Class 3 frames that the port has transmitted.
RxWords	The number of Class 3 4-byte words within frames that the port has received.
TxWords	The number of Class 3 4-byte words within frames that the port has transmitted.
Disc Frames	The number of Class 3 frames that have been discarded upon receipt by this port. There are no FBSYs (Fabric Busy link response) or FRJTs (Frame Reject link response) generated for Class 3 frames.

Output Example

The output from the perf.class3 command displays as follows.

```
Port 2
Statistic   Count       Wrap
----------- ----------- -----------
```

```
RxFrames     2953184     23
TxFrames     1842953     12
RxWords      2953184     65
TxWords      1842953     32
Disc Frames  2953184     26
```

perf.clearStats

Syntax

```
clearStats portNumber
```

Purpose

This command resets all port statistics for an individual port or for all ports.

Parameters

This command has one parameter.

portNumber — Specifies the port number.

Valid values are:

0–15 for the edge switch 2/16

0–31 for the edge switch 2/32

0–63 for the director 2/64

all for every port on the director or switch

Command Example

```
Root> perf clearStats 4
Root> perf clearStats all
```

perf.errors

Syntax

```
errors portNumber
```

Purpose

This command displays port error counters for a single port.

Parameters

This command has one parameter.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> perf errors 2
```

Output

The port error counter data is displayed as a table that includes the following statistics.

Port	The port number.
Prim Seq Err	The number of state machine protocol errors detected by the port hardware.
Disc Frms	The number of received frames discarded due to a frame size of less than size words or to frames dropped because the BB credit was zero. This number is counted during the first round of frame verification and applies to both Class 2 and Class 3 traffic.
Inv Tx Wrds	The number of 10-bit transmission words that the port is unable to map to 8-bit bytes because of disparity errors or misaligned K characters while in the OL2 or OL3 state.

CRC Errs	The number of frame CRC errors detected by the port.
Dlim Errs	The number of invalid frame delimiters (SOF or EOF) received by the port.
Addr Id Errs	The number of frames received with unknown addressing.

Output Example

The output from the perf.errors command displays as follows.

```
Port 2
Statistic    Count
-----------  ----------
Prim Seq Err 753452
Disc Frms    351269
Inv Tx Wrds  2953184
CRC Errs     1842953
Delim Errs   2953184
Addr Id Errs 1842953
```

perf.link

Syntax

```
link portNumber
```

Purpose

This command displays port link counters for a single ports.

Parameters

This command has one parameter.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> perf link 2
```

Output

The port link counter data is displayed as a table that includes the following statistics.

Port	The port number.
OLS In	The number of offline sequences initiated by the attached N_Port.
OLS Out	The number of offline sequences initiated by this director or switch port.
Reset In	The number of link resets initiated by the attached N_Port.
Reset Out	The number of link resets initiated by this director or switch.
Link Flrs	The number of times the port has detected a link error resulting from an invalid link state transition or timeout.
Sync Losses	The number of times the port has detected a loss of synchronization timeout while not in an offline or LF2 state.
Sig Losses	The number of times the port has detected a loss of signal while not in an offline or LF2 state.

Output Example

The output from the perf.link command displays as follows.

```
Port 2
Statistic    Count
-----------  ----------
OLS In       753452
OLS Out      351269
Reset In     2953184
Reset Out    1842953
Link Flrs    2953184
Sync Losses  1842953
Sig Losses   35246
```

perf.traffic

Syntax

```
traffic portNumber
```

Purpose

This command displays port traffic counters for a single port.

Parameters

This command has one parameter.

portNumber	Specifies the port number. Valid values are: 0–15 for the edge switch 2/16 0–31 for the edge switch 2/32 0–63 for the director 2/64

Command Example

```
Root> perf traffic 2
```

Output

The port traffic counter data is displayed as a table that includes the following statistics, along with a wrap count for each corresponding counter.

Port	The port number.
Rx%	The received link utilization percentage.
Tx%	The transmitted link utilization percentage.
RxFrames	The number of Fibre Channel Class 2 and Class 3 frames that the port has received.
TxFrames	The number of Fibre Channel Class 2 and Class 3 frames that the port has transmitted.
RxWords	The number of 4-byte words in Class 2 and Class 3 frames that the port has received.

TxWords — The number of 4-byte words in Class 2 and Class 3 frames that the port has transmitted.

Output Example

The output from the perf.traffic command displays as follows.

```
Port 2
Statistic    Count       Wrap
-----------  ----------  ----------
Rx%          75          N/A
Tx%          30          N/A
RxFrames     2953184     23
TxFrames     1842953     12
TxWords      2953184     65
TxWords      1842953     32
```

show Commands

The show branch of the CLI command tree contains commands that display, but do not change, stored data values. The displayed output that results from these commands is not necessarily identical with the output from the show commands that are within the other CLI command tree branches, for example, config.port.show.

The commands in the show branch can by used by either the Administrator or the Operator.

show.eventLog

Syntax

```
eventLog
```

Purpose

This command shows the contents of the event log as maintained in NV-RAM on the director or switch.

Parameters

This command has no parameters.

Command Example

```
Root> show eventLog
```

Output

The event log data are displayed as a table that includes the following properties:

Date/Time	The date and time when the event occurred.
Code	The event reason code.
Severity	The severity of the event. The values are:
	Major—Unit operational (major failure).
	Minor—Unit operational (minor failure).
Severity	Severe—Unit not operational.
(continued)	The causes are either the switch contains no operational SBAR cards or the system shutdowns due to CTP thermal threshold violations.
	Info—Unit operational (information only).
FRU	The FRU and FRU position, where applicable.
Event Data	The 32-byte hexidecimal description of the event in words.

Output Example

The output from the show.eventLog command displays as follows.

```
Date/Time          Code  Severity  FRU    Event Data
--------------     ----  --------  -----  --------------------------------
04/12/01  10:58A  375   Major     CTP-0  00010203 04050607 08090A0B 0C0D0E0F
04/12/01   9:58A  385   Severe    CTP-0  00010203 04050607 08090A0B 0C0D0E0F
04/11/01   7:18P  395   Severe    CTP-0  00010203 04050607 08090A0B 0C0D0E0F
```

show.frus

Syntax

```
frus
```

Purpose

This command displays information about all FRUs.

Parameters

This command has no parameters.

Command Example

```
Root> show frus
```

Output

The FRU information is displayed as a table that includes the following properties:

FRU	The FRU name. NotInstalled means the FRU is not installed.
Position	The relative position of the FRU, that is, its slot.
State	The state of the FRU. Values are: • Active—the current module is active. • Backup—this module is not currently being used, but it is available for immediate failover. • Failed—the current module is failed.
Serial Num	The serial number of the FRU.
Part Num	The part number of the FRU.
Beaconing	The beaconing state of the FRU (on or off).
Pwr On Hrs	The power-on hours value for the FRU.

Output Example

The output from the show.frus command displays as follows.

```
FRU       Position  State   Serial Num  Part Num           Beacon Pwr On Hrs
--------  --------  ------  ----------  ------------------ ------ -------
CTP       0         Backup  81440005    254136-001           off     4512
CTP       1         Active  81440011    254136-001           off     4512
SBAR      0         Active  21109984    254133-001           off     8616
SBAR      1         Backup  21101442    254133-001           off     8616
Power     0         Active  22044540    254137-001           off     8616
Power     1         Active  22044548    254137-001           off     8616
Fan       0         Active                                   off     0
Fan       1         Active                                   off     0
Backplane 0         Active  21050137    254131-001           off     8616
UPM       0         Active  82060705    292006-001           off     1464
UPM       1         Active  82060627    292006-001           off     1464
UPM       2         Active  82060959    292006-001           off     1457
UPM       3         Active  82060621    292006-001           off     1464
UPM       4         Active  82060632    292006-001           off     1464
UPM       5         Active  82060694    292006-001           off     1458
UPM       6         Active  82063621    292006-001           off     1458
UPM       7         Active  82060639    292006-001           off     1456
UPM       8         Active  82051711    292006-001           off     1455
UPM       9         Active  82051779    292006-001           off     1469
UPM       10        Active  82060969    292006-001           off     1454
UPM       11        Active  82051819    292006-001           off     1455
UPM       12        Active  82060660    292006-001           off     1456
UPM       13        Active  82051743    292006-001           off     1471
UPM       14        Active  82063560    292006-001           off     1456
UPM       15        Active  82051815    292006-001           off     1471
```

show.ip.ethernet

Syntax

```
ethernet
```

Purpose

This command displays ethernet attributes.

Parameters

This command has no parameters.

Command Example

```
Root> show ip ethernet
```

Output

The Ethernet attributes data is displayed as a table that includes the following properties:

IP Address	The IP address for the Ethernet adapter as set in the config.ip.ethernet command.
Gateway Address	The gateway address for the Ethernet adapter as set in the config.ip.ethernet command.
Subnet Mask	The subnet mask for the Ethernet adapter as set in the config.ip.ethernet command.

Output Example

The output from the show.ip.ethernet command displays as follows.

```
LAN Information
IP Address:       144.49.10.15
Gateway Address:  144.49.10.1
Subnet Mask:      255.255.255.0
```

show.login.server

Syntax

```
loginServer
```

Purpose

This command displays information from the login server database for devices attached to this switch.

Parameters

This command has no parameters.

Command Example

```
Root> show loginServer
```

Output

The device information is displayed as a table that includes the following properties:

Port	The port number where the device is attached.
BB Crdt	The maximum number of remaining frames that can be transmitted without causing a buffer overrun condition at the receiver.
RxFldSz	The buffer-to-buffer receive data field size from the FLOGI received from the attached N_Port.
COS	The class of service (for example, 1; 2; 3; 4; 5; 6; F; 1,2; 2,3).
Port Name	The port world-wide name of the attached device.
Node Name	The node world-wide name of the attached device.

Output Example

The output from the show.loginServer command displays as follows.

```
Port BB Crdt  RxFldSz  COS  Port Name               Node Name
---- -------  -------  ---  ----------------------  ----------------------
0    10             2,3  00:11:22:33:44:55:00:77  20:11:22:33:44:55:66:77
1    10              2   00:11:22:33:44:55:00:78  20:11:22:33:44:55:66:78
4    10             2,3  00:11:22:33:44:55:00:79  20:11:22:33:44:55:66:79
7    10             2,3  00:11:22:33:44:55:00:80  20:11:22:33:44:55:66:80
8    10              2   00:11:22:33:44:55:00:81  20:11:22:33:44:55:66:81
10   10             2,3  00:11:22:33:44:55:00:82  20:11:22:33:44:55:66:82
11   10             2,3  00:11:22:33:44:55:00:83  20:11:22:33:44:55:66:83
12   10              3   00:11:22:33:44:55:00:84  20:11:22:33:44:55:66:84
13   10             2,3  00:11:22:33:44:55:00:85  20:11:22:33:44:55:66:85
15   10             2,3  00:11:22:33:44:55:00:86  20:11:22:33:44:55:66:86
```

show.nameServer

Syntax

```
nameServer
```

Purpose

This command displays information from the name server database for devices attached to this switch.

Parameters

This command has no parameters.

Command Example

```
Root> show nameServer
```

Output

The device information data is displayed as a table that includes the following properties:

Type	The type (N, NL, F/NL, F, FL, E, B).
Port Id	The 24-bit Fibre Channel address.
Port Name	The port world-wide name of the attached device.
Node Name	The node world-wide name of the attached device.
COS	The class of service (for example, 1; 2; 3; 4; 5; 6; F; 1,2; 2,3).
FC4 Types	The FC4 types registered for this device. The numbers in this field correspond to the list at the bottom of the table.

Output Example

The output from the show.nameServer command displays as follows.

```
Type  Port Id  Port Name               Node Name               COS  FC4 Types
----  -------  ----------------------- ----------------------- ---
---------
N     010400   00:11:22:33:44:55:66:77  20:11:22:33:44:55:66:77  2,3  2
N     010500   00:11:22:33:44:55:66:78  20:11:22:33:44:55:66:78  2,3  0
N     010600   00:11:22:33:44:55:66:79  20:11:22:33:44:55:66:79  2,3  2
N     010700   00:11:22:33:44:55:66:80  20:11:22:33:44:55:66:80  2    2
N     010800   00:11:22:33:44:55:66:81  20:11:22:33:44:55:66:81  3    2
N     010900   00:11:22:33:44:55:66:82  20:11:22:33:44:55:66:82  3    2
N     010C00   00:11:22:33:44:55:66:83  20:11:22:33:44:55:66:83  2,3  2
N     010D00   00:11:22:33:44:55:66:84  20:11:22:33:44:55:66:84  2,3  2
N     010E00   00:11:22:33:44:55:66:85  20:11:22:33:44:55:66:85  2    5
N     010F00   00:11:22:33:44:55:66:86  20:11:22:33:44:55:66:86  2    4
N     011200   00:11:22:33:44:55:66:87  20:11:22:33:44:55:66:87  2,3  2
N     011300   00:11:22:33:44:55:66:88  10:11:22:33:44:55:66:88  2,3  2

FC4 Types
0: ISO/IEC 8802-2 LLC
1: ISO/IEC 8802-2 LLC/SNAP
2: SCSI-FCP
3: SCSI-GPP
4: IPI-3 Master
5: IPI-3 Slave
6: IPI-3 Peer
7: CP IPI-3 Master
8: CP IPI-3 Slave
9: CP IPI-3 Peer
10: SBCCS-Channel
11: SBCCS-Control Unit
12: FC-SB-2 Channel to Control Unit
13: FC-SB-2 Control Unit to Channel
14: Fibre Channel Service
15: FC-FG
16: FC-SW
```

```
17: FC-AL
18: SNMP
19: HIPPI-FP
20: Vendor Unique
```

show.port.config

Syntax

```
config
```

Purpose

This command shows the port configuration for all ports.

Parameters

This command has no parameters.

Command Example

```
Root> show port config
```

Output

The port configuration attributes are displayed as a table that includes the following properties:

Port	The port number.
Name	The name of the port as set in the config.port.name command.
Blocked	The blocked state of the port as set in the config.port.blocked command.
Ext Dist	The extended distance state as set in the config.port.extDist command.
Type	The port type as set in the config.port.type command.
Speed	The port speed as set in the config.port.speed command.

Output Example

The output from the show.port.config command displays as follows.

```
Port  Name                     Blocked  Ext Dist Type   Speed
----  -----------------------  -------  -------- -----  ---------
0     Port 1                   false    false    fPort  1 Gb/sec
1     Port 2                   true     true     fPort  1 Gb/sec
2     Port 3                   false    false    gPort  1 Gb/sec
3     Port 4                   false    false    fPort  2 Gb/sec
4     Port 5                   true     true     fPort  2 Gb/sec
5     Port 6                   false    false    fPort  2 Gb/sec
6     Port 7                   true     true     fPort  1 Gb/sec
7     Port 8                   false    false    fPort  Negotiate
8     Port 9                   false    true     fPort  1 Gb/sec
9     Port A                   false    false    fPort  1 Gb/sec
10    Port B                   false    false    fPort  2 Gb/sec
11    Port C                   false    false    fPort  2 Gb/sec
12    Port D                   false    false    fPort  1 Gb/sec
13    Port E                   false    false    fPort  1 Gb/sec
14    Port F                   false    false    fPort  1 Gb/sec
15    Port X                   false    false    fPort  1 Gb/sec
```

show.port.info

Syntax

```
info
```

Purpose

This command displays port information for all ports.

Parameters

This command has no parameters.

Command Example

```
Root> show port info
```

Output

The port information data is displayed as a table that includes the following properties:

Port	The port number.
WWN	The world-wide name of the port.
OpSpeed	The current operating speed (1.0625 Gbps, 2.125 Gbps, or Not Established).
SpeedCap	The current transceiver capability speed (1.0625 or 2.125 Gbps).

Output Example

The output from the show.port.info command displays as follows.

```
Port  WWN                       OpSpeed   SpeedCap
----  ------------------------  --------  --------
0     10:00:80:00:11:22:33:44  1 Gb/sec  2 Gb/sec
1     10:00:80:01:11:22:33:44  1 Gb/sec  2 Gb/sec
2     10:00:80:02:11:22:33:44  1 Gb/sec  2 Gb/sec
3     10:00:80:03:11:22:33:44  1 Gb/sec  2 Gb/sec
4     10:00:80:04:11:22:33:44  2 Gb/sec  2 Gb/sec
5     10:00:80:05:11:22:33:44  2 Gb/sec  2 Gb/sec
6     10:00:80:06:11:22:33:44  2 Gb/sec  2 Gb/sec
7     10:00:80:07:11:22:33:44  2 Gb/sec  2 Gb/sec
8     10:00:80:08:11:22:33:44  2 Gb/sec  2 Gb/sec
9     10:00:80:09:11:22:33:44  2 Gb/sec  2 Gb/sec
10    10:00:80:10:11:22:33:44  1 Gb/sec  2 Gb/sec
11    10:00:80:11:11:22:33:44  1 Gb/sec  2 Gb/sec
12    10:00:80:12:11:22:33:44  1 Gb/sec  2 Gb/sec
13    10:00:80:13:11:22:33:44  1 Gb/sec  2 Gb/sec
14    10:00:80:14:11:22:33:44  1 Gb/sec  2 Gb/sec
15    10:00:80:15:11:22:33:44  1 Gb/sec  2 Gb/sec
```

show.port.status

Syntax

```
status
```

Purpose

This command displays port status for all ports.

Parameters

This command has no parameters.

Command Example

```
Root> show port status
```

Output

The port status data is displayed as a table that includes the following properties:

Port	The port number.
State	The port state. For example: • Segmented E_Port • Invalid Attachment • Not Installed • Online • Offline • Not Operational • No Light • Testing • Port Failure • Link Reset • Inactive

Type	The operational port type. If the configured port type is F_Port or E_Port, this value will match the configured type. If the configured type is G_Port, this value can be E_Port, F_Port, or G_Port, depending on what is connected to the port.
Attached WWN	The world-wide name of the device or switch attached to the port, if one is attached.
Beaconing	The beaconing state for the port (true or false).
Reason	An optional message number that indicates if the port has a segmented ISL or if a port binding violation has occurred, or if the part is inactive. The message description for this message number is provided at the bottom of the table. State is Segmented E_Port 0 Segment Not Defined 1 Incompatible Operating Parameters 2 Duplicate Domain ID(s) 3 Incompatible Zoning Configurations 4 Build Fabric Protocol Error 5 No Principal Switch 6 No Response from Attached Switch 7 ELP Retransmission Failure Timeout State is Invalid Attachment 0 Unknown 1 ISL connection not allowed on this port. 2 ELP rejected by the attached switch. 3 Incompatible switch at other end of the ISL. 4 External loopback adapter connected to the port. 5 N_Port connection not allowed on this port. 6 Non-HP switch at other end of the ISL. 7 ISL connection not allowed on this port. 8 ISL connection not allowed to external Fabrics. 9 Port binding violation—unauthorized WWN.

State is Inactive
0 Inactive - RC 0
1 No Serial Number
2 Feature not enabled
3 Switch Speed Conflict
4 Optics Speed Conflict
5 No SBAR support

Output Example

The output from the show.port.status command displays as follows.

```
Port State              Type   Attached WWN             Beaconing
Reason
---- ----------------   -----  -----------------------  ---------
------
0    Online             fPort  10:00:80:00:11:22:33:44  false
1    Online             gPort  10:00:80:00:11:22:33:45  true
2    No Light           fPort  10:00:80:00:11:22:33:55  true
3    Offline            ePort  10:00:80:00:11:22:33:00  false
4    Online             gPort  10:00:80:00:11:22:33:57  false
5    Port Failure       fPort  10:00:80:00:11:22:33:46  false
6    Link Reset         gPort  10:00:80:00:11:22:33:63  false
7    Segmented E_Port   ePort  10:00:80:00:11:22:33:47  false     2
8    Online             ePort  10:00:80:00:11:22:33:88  false
9    Offline            fPort  10:00:80:00:11:22:33:49  false
10   Inactive           ePort  10:00:80:00:11:22:33:50  false     3
11   Online             fPort  10:00:80:00:11:22:33:53  false
12   No Light           fPort  10:00:80:00:11:22:33:56  false
13   Online             fPort  10:00:80:00:11:22:33:59  false
14   Invalid Attachment fPort  10:00:80:00:11:22:33:64  false     7
15   Online             fPort  10:00:80:00:11:22:33:66  false

2: Duplicate Domain ID(s)
3: Switch Speed Conflict
7: ISL connection not allowed on this port
```

show.port.technology

Syntax

```
technology
```

Purpose

This command displays port technology information for all ports.

Parameters

This command has no parameters.

Command Example

```
Root> show port technology
```

Output

The port technology data is displayed as a table that includes the following properties:

Port	The port number.
Connectr	The port connector type (LC, MT_RJ, MU, Internal).
Transcvr	The transceiver type: • Long LC • Short • Short OFC • Long LL • Long Dist
Distance	The distances supported: • Short • Intermediate • Long • Very Long

Media — The media type:

- M-M 62.5um
- M-M 50um
- M-M 50
- 62.5um,
- S-M 9um
- Copper

Output Example

The output from the show.port.technology command displays as follows.

```
Port Connectr  Transcvr  Distance     Media
---- -------- --------- ------------ ----------- -----------
0    LC        Long LC   Long         M-M 50um
1    LC        Long LC   Long         M-M 50um
2    LC        Long LC   Long         M-M 50um
3    MT_RJ     Long LC   Long         M-M 50um
4    MT_RJ     Long LC   Long         M-M 50um
5    MT_RJ     Long LC   Long         M-M 50um
6    LC        Long LC   Long         M-M 50um
7    LC        Long LC   Long         M-M 50um
8    LC        Long LC   Long         M-M 50um
9    LC        Long LC   Long         M-M 50um
10   LC        Long LC   Long         M-M 50um
11   LC        Long LC   Long         M-M 50um
12   LC        Long LC   Long         M-M 50um
13   LC        Long LC   Long         M-M 50um
14   LC        Long LC   Long         M-M 50um
15   LC        Long LC   Long         M-M 50um
```

show.security.portBinding

Syntax

```
portBinding
```

Purpose

This command shows the port binding configuration for all ports.

Parameters

This command has no parameters.

Command Example

```
Root> show security portBinding
```

Output

The port binding configuration data is displayed as a table that includes the following properties:

Port	The port number.
WWN Binding	The state of port binding for the specified port: • active • inactive
Bound WWN	The WWN of the device that is bound to the specified port. If this field is blank, no device is bound to the specified port.

Output Example

The output from the show.security.portBinding command displays as follows.

```
Port     WWN Binding     Bound WWN
----     -----------     ----------------------
0      Active          AA:00:AA:00:AA:00:AA:00
1      Inactive        00:00:00:00:00:00:00:00
2      Inactive        CC:33:44:55:CC:33:44:55
3      Active          00:00:00:00:00:00:00:00
4      Inactive       00:00:00:00:00:00:00:00
```

```
5       Inactive         00:00:00:00:00:00:00:00
6       Inactive         00:00:00:00:00:00:00:00
7       Inactive 00:00:00:00:00:00:00:00
8       Inactive         00:00:00:00:00:00:00:00
9       Inactive         00:00:00:00:00:00:00:00
10      Inactive         00:00:00:00:00:00:00:00
11      Inactive         00:00:00:00:00:00:00:00
12      Inactive         00:00:00:00:00:00:00:00
13      Inactive         00:00:00:00:00:00:00:00
14      Inactive         00:00:00:00:00:00:00:00
15      Inactive         00:00:00:00:00:00:00:00
```

show.switch

Syntax

```
switch
```

Purpose

This command displays switch attributes.

Parameters

This command has no parameters.

Command Example

```
Root> show switch
```

Output

The switch attributes data is displayed as a table that includes the following properties:

State	The state of the switch. For example: • online • offline
BB Credit	The BB credit as set in the **config.switch.bbCredit** command.
R_A_TOV	The R_A_TOV as set in the **config.switch.raTov** command.
E_D_TOV	The E_D_TOV as set in the **config.switch.edTov** command.

Preferred Domain Id	The domain ID as set in the **config.switch.domainId** command.
Switch Priority	The switch priority as set in the **config.switch.priority** command.
Speed	The switch speed as set in the **config.switch.speed** command.
Rerouting Delay	The rerouting delay as set in the **config.switch.rerouteDelay** command.
Operating Mode	The operating mode (Open Systems or S/390). This attribute cannot be configured through the command line interface.
Interop Mode	The interoperability mode as set in the **config.switch.interopMode** command.
Active Domain Id	The active domain ID of the switch. This ID may or may not be the same as the preferred domain ID.
World Wide Name	The world-wide name for the switch.

Output Example

The output from the show.switch command displays as follows.

```
Switch Information
State:               Online
BB Credit:           2
R_A_TOV:             20
E_D_TOV:             4
Preferred Domain Id: 1
Switch Priority:     Default
Speed:               2 Gb/sec
Rerouting Delay:     Enabled
Operating Mode:      Open Systems
Interop Mode:        Open Fabric 1.0
Active Domain Id:    1
World Wide Name:     10:00:08:00:88:00:21:07
```

show.system

Syntax

```
system
```

Purpose

This command displays a set of system attributes.

Parameters

This command has no parameters.

Command Example

```
Root> show system
```

Output

The system attributes are displayed as a table that includes the following properties:

Name	The system name as set in the **config.system.name** command.
Description	The system description as set in the **config.system.description** command.
Contact	The system contact as set in the **config.system.contact** command.
Location	The system description as set in the **config.system.description** command.
Date/Time	The system date and time as set in the **config.system.date** command.
Serial Number	The serial number for the system.
Type Number	The type number for the system.
Model Number	The model number for the system (for example, director 2/64).
EC Level	The engineering change level installed.
Firmware Version	The current firmware version installed.

Beaconing — The enabled state of unit beaconing (enabled or disabled) as set in the maint.system.beacon command.

Output Example

The output from the show.system command displays as follows.

```
System Information
Name:                       hp3 director
Description:                hp StorageWorks director 2/64
Contact:                    Joe
Location:                   Everywhere
Date/Time:                  04/16/2001  10:34:01AM
Serial Number:              123456789
Type Number:                1
Model Number;               director 2/64
EC Level:                   1
Firmware Version:           01.03.00 34
Beaconing:                  Disabled
```

show.zoning

Syntax

```
zoning
```

Purpose

This command shows the zoning configuration saved on the fabric.

Parameters

This command has no parameters.

Command Example

```
Root> show zoning
```

Output

The zoning configuration data is displayed as a table that includes the following properties:

Active ZoneSet — The enabled status, name, and member zones of the zone set.

Output Example

The output from the show.zoning command displays as follows.

```
Active Zone Set
Default Zone Enabled:  False
ZoneSet:  TheUltimateZoneSet
    Zone:  TheUltimateZone
           ZoneMember: Domain 10, Port 6
           ZoneMember: Domain 15, Port 2
           ZoneMember: Domain 2, Port 63
           ZoneMember: 10:00:00:00:C9:22:9B:64
           ZoneMember: 10:00:00:00:C9:22:9B:BD
    Zone:  TheNotSoUltimateZone
           ZoneMember: 10:00:00:00:C9:22:9B:AB
           ZoneMember: 10:00:00:00:C9:22:9B:C6
           ZoneMember: 10:00:00:00:C9:22:9B:AB
    Zone:  TheNotUltimateAtAllZone
           ZoneMember: Domain 2, Port 63
```

A

Error Messages

This appendix lists and explains error messages for the command line interface (CLI). Any error numbers that are not listed are reserved for future use.

The message that is returned is a string that includes the error number and the text of the message.

Error 08: Invalid Switch Name

Description

The value entered for the switch name is invalid.

Action

The name for a director 2/64, edge switch 2/16, or edger switch 2/32 can contain 0–24 characters. Enter a name with 0–24 characters. If spaces are used, enclose the name in quotation marks.

Error 09: Invalid Switch Description

Description

The value entered for the switch description is invalid.

Action

The description for the director or switch can contain 0–255 characters. Enter a description with 0–255 characters. If spaces are used, enclose the description in quotation marks.

Error 10: Invalid Switch Location

Description

The value entered for the switch location is invalid.

Action

The location for the director or switch can contain 0–255 characters. Enter a location with 0–255 characters. If spaces are used, enclose the location in quotation marks.

Error 11: Invalid Switch Contact

Description

The value entered for the switch contact is invalid.

Action

The contact for the director or switch can contain 0–255 characters. Enter a contact with 0–255 characters. If spaces are used, enclose the contact in quotation marks.

Error 13: Invalid Port Number

Description

The value entered for the port number is invalid.

Action

Enter a port number within the range supported by the director or switch. Valid values are:

0–15 for the edge switch 2/16

0–31 for the edge switch 2/32

0–63 for the director 2/64

Error 14: Invalid Port Name

Description

The value entered for the port name is invalid.

Action

The port name for the individual port can contain 0–24 characters. Enter a name with 0–24 characters. If spaces are used, enclose the name in quotation marks.

Error 15: Invalid BB Credit

Description

The value entered for the buffer-to-buffer credit is invalid.

Action

The buffer-to-buffer credit must be an integer in the range 1–60. Enter a value in the range 1–60 characters. A buffer-to-buffer credit is not used for ports configured for extended distance.

Error 16: Invalid R_A_TOV

Description

The value entered for the resource allocation time-out value is invalid.

Action

The R_A_TOV is entered in tenths of a second and must be an integer in the range 10–1200 (1 second to 120 seconds). The R_A_TOV value must be larger than the E_D_TOV value. Enter a value in the range 10–1200 that is larger than the E_D_TOV value.

Error 17: Invalid E_D_TOV

Description

The value entered for the error detect time-out value is invalid.

Action

The E_D_TOV is entered in tenths of a second and must be an integer in the range 2–600 (0.2 second to 60 seconds). The E_D_TOV value must be smaller than the R_A_TOV value. Enter a value in the range 2–600 that is smaller than the R_A_TOV value.

Error 18: Invalid TOV

Description

The values for the E_D_TOV and R_A_TOV do not meet the requirement that the E_D_TOV value be smaller than the R_A_TOV value.

Action

Enter an E_D_TOV value in the range 2–600 (0.2 second to 60 seconds) that is smaller than the R_A_TOV value, or enter an R_A_TOV time-out value in the range 10–1200 (1 second to 120 seconds) that is larger than the E_D_TOV value.

Error 20: Invalid Preferred Domain ID

Description

The value entered for the preferred domain ID for the director or switch is invalid.

Action

The preferred domain ID must be an integer in the range 1–31. Enter a value in the range 1–31.

Error 21: Invalid Switch Priority

Description

The value entered for the switch priority is invalid.

Action

The switch priority entered for the director or switch must be *principal*, *default*, or *neverprincipal*. (Refer to the description of the command in config.switch.priority on page 2-25.) Enter *principal*, *default*, or *neverprincipal*.

Error 29: Invalid Gateway Address

Description

The value entered for the gateway address is invalid.

Action

The new gateway address for the Ethernet interface must be entered in dotted decimal format (for example, 0.0.0.0). Enter the gateway address for the Ethernet interface in the dotted decimal format.

Error 30: Invalid IP Address

Description

The value entered for the IP address of the director or switch is invalid.

Action

The IP address for the Ethernet interface must be entered in dotted decimal format (for example, 10.0.0.0). Enter the IP address for the Ethernet interface in dotted decimal format.

Error 31: Invalid Subnet Mask

Description

The value entered for the new subnet mask for the Ethernet interface is invalid.

Action

The subnet mask must be entered in dotted decimal format (for example, 255.0.0.0). Enter the subnet mask for the Ethernet interface in dotted decimal format.

Error 32: Invalid SNMP Community Name

Description

The value entered for the SNMP community name is invalid.

Action

The SNMP community name is the name of the community specified in the config.snmp.addCommunity command. The community name must not exceed 32 characters. Valid characters include all those in the ISO Latin-1 character set. Duplicate community names are allowed, but the corresponding writeAuthorization values must match. Enter an SNMP community name that meets all of the requirements.

Error 33: Invalid SNMP Trap Address

Description

The value entered for the SNMP trap address is invalid.

Action

The new SNMP trap address for the SNMP interface must be entered in dotted decimal format (for example, 10.0.0.0). Enter an SNMP trap address that meets the requirements.

Error 34: Duplicate Community Names Require Identical Write Authorization

Description

The two or more entered community names are identical, but their corresponding write authorizations are not identical.

Action

Enter different values for the community names, or enter identical write authorizations for the duplicate community names.

Error 37: Invalid Month

Description

The value of the month entered for the new system date is invalid.

Action

The format of the date parameter must be mm:dd:yyyy or mm/dd/yyyy. The month must contain an integer in the range 1–12. Enter a date, including a month in the range 1–12.

Error 38: Invalid Day

Description

The value of the day entered for the new system date is invalid.

Action

The format of the date parameter must be mm:dd:yyyy or mm/dd/yyyy. The day must contain an integer in the range 1–31. Enter a date, including a day in the range 1–31.

Error 39: Invalid Year

Description

The value of the year entered for the new system date is invalid.

Action

The format of the date parameter must be mm:dd:yyyy or mm/dd/yyyy. The year must contain an integer greater than 1980. Enter a date, including a year greater than 1980.

Error 40: Invalid Hour

Description

The value of the hour entered for the new system time is invalid.

Action

The format of the time parameter must be hh:mm:ss. The hour must contain an integer in the range 0–23. Enter a time, including an hour in the range 0–23.

Error 41: Invalid Minute

Description

The value of the minute entered for the new system time is invalid.

Action

The format of the time parameter must be hh:mm:ss. The minute must contain an integer in the range 0–59. Enter a time, including minutes in the range 0–59.

Error 42: Invalid Second

Description

The value of the second entered for the new system time is invalid.

Action

The format of the time parameter must be hh:mm:ss. The second must contain an integer in the range 0–59. Enter a time, including seconds in the range 0–59.

Error 44: Max SNMP Communities Defined

Description

A new SNMP community cannot be defined before removing an existing community from the list.

Action

A total of six communities may be defined for SNMP. Remove at least one of the current communities, and then define the new community.

Error 45: Not Allowed While Switch Online

Description

The entered command requires that the director or switch be set offline.

Action

Set the director or switch offline before reentering the command.

Error 55: Invalid Zone Name

Description

The value entered for the zone name is invalid.

Action

The zone name must contain 1–64 characters. Valid characters are ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789 $-^_ (spaces are not permitted, and the first character must be alphabetical). Enter a zone name in the range of 1–64 characters, using the valid characters.

Error 57: Duplicate Zone

Description

Two or more zone names in the zone set are identical.

Action

All zone names within a zone set must be unique. Enter a zone name that does not duplicate the name of another zone within the zone set.

Error 59: Zone Name in Use

Description

Two or more zone names in the zone set are identical.

Action

All zone names within a zone set must be unique. Enter a zone name that does not duplicate the name of another zone within the zone set.

Error 60: Invalid Number of Zone Members

Description

The entered command tried to add more zone members than the zone can hold.

Action

Delete one or more zone members in the zone, and then resubmit the command to add the new zone member.

Error 61: Invalid Zone Member Type

Description

The specified zone member is neither a world-wide name (WWN) nor a domain-port pair.

Action

The zone member type must be either a world-wide name (WWN) or a domain-port pair. Refer to config.zoning.addWwnMem on page 2-41 or config.zoning.addPortMem on page 2-42 for specific requirements. Enter either a WWN or domain-port pair that meets the requirements.

Error 62: Invalid Zone Set Name

Description

The value entered for the zone set name is invalid.

Action

The zone set name must contain 1–64 characters. Valid characters are ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789 $-^_ (spaces are not permitted, and the first character must be alphabetical). Enter a zone set name in the range of 1–64 characters, using the valid characters.

Error 69: Duplicate Port Name

Description

Two or more port names are identical.

Action

Port names must be unique. The name must contain 1–24 characters. Enter a port name in the range of 1–24 characters.

Error 70: Invalid Device Type

Description

The specified FRU does not exist on this product.

Action

Refer to the product service manual for product-specific FRU information.

Error 71: FRU Not Installed

Description

The specified FRU is not installed.

Action

Refer to the product service manual for product-specific FRU information and procedures.

Error 72: No Backup FRU

Description

The FRU cannot be swapped because a backup FRU is not installed.

Action

Refer to the product service manual for product-specific FRU information and procedures. Insert a backup FRU, and reenter the command.

Error 73: Port Not Installed

Description

The specified port is not installed on the product.

Action

Refer to the product service manual for information about installing a port optic.

Error 74: Invalid Number of Zones

Description

The specified zone set contains less than one zone or more than the maximum number of zones allowed for this product.

Action

The zone set must contain at least one zone. Add or remove zones to stay within the required number of zones for this product.

Error 75: Invalid Zone Set Size

Description

The specified zone set exceeds the NV-RAM limitations of the director or switch.

Action

Reduce the size of the zone set to meet the NV-RAM limitations of the product. Reduce the number of zones in the zone set, reduce the number of members in a zone, or reduce the zone name lengths.

Error 76: Invalid Number of Unique Zone Members

Description

The specified zone contains more than the maximum number of zone members allowed per zone set for this product.

Action

Reduce the number of members in the zone before reentering the command.

Error 77: Not Allowed While Port Is Failed

Description

The specified port is in a failed or inactive state or requires service.

Action

Refer to the product service manual for the appropriate action.

Error 78: System Error Light On

Description

This product cannot beacon because the system error light is on.

Action

Refer to the product service manual for the appropriate procedure. Clear the system error light before enabling beaconing.

Error 79: FRU Failed

Description

The specified FRU has failed.

Action

Refer to the product service manual for the appropriate procedure.

Error 81: Default Zone Enabled

Description

The request cannot be completed because the default zone is enabled.

Action

Disable the default zone before reentering the command.

Error 82: Invalid Interop Mode

Description

The value entered for the interoperability mode is not valid.

Action

The interoperability mode for the director or switch must be Homogenous Fabric or Open Fabric 1.0. Enter either *Homogenous Fabric* or *Open Fabric 1.0* to set the interoperability mode.

Error 83: Not Allowed in Open Fabric Mode

Description

Zone member cannot be put into the default zone while the product is operating in Open Fabric 1.0 mode. For example, if the following series of commands is entered, Error 83 results:

```
Root> maint system setOnlineState false
Root> config switch interopMode open
Root> config zoning setDefZoneState true
```

Action

Configure the interoperability mode as *Homogenous Fabric* in the previous series of commands.

Error 88: Invalid Feature Key Length

Description

The value of the specified feature key is longer than the maximum length allowed.

Action

Refer to config.features.installKey on page 2-2 for requirements, and reenter the feature key. If problems persist, contact your sales representative.

Error 89: Operational Mode S390

Description

This procedure is not allowed in S/390 mode.

Action

The entered command is only supported when the product is in Open Systems mode. The product cannot be taken out of S/390 mode through the CLI. Use the HAFM application to change the product operating mode, and then reenter the command.

Error 90: Invalid Port Type

Description

The configured port type is invalid.

Action

The port may be configured as an E_Port, G_Port, or F_Port. Reconfigure the port, and then resubmit the command.

Error 91: E_Port Type Configured

Description

Ports cannot be configured as E_Ports in S/390 mode.

Action

Reconfigure the port as either an F_Port or a G_Port, and then resubmit the command.

Error 92: Not Allowed While Port Is Unblocked

Description

The port must be blocked to complete this request.

Action

Block the port, and then resubmit the command.

Error 94: Invalid Feature Combination

Description

The requested features cannot be installed at the same time on one director or switch.

Action

Contact your sales representative.

Error 99: Preferred Domain ID Cannot Be Zero

Description

This switch cannot be configured to have a preferred domain ID equal to zero (0).

Action

Enter an integer in the range 1–31 for the preferred domain ID.

Error 101: Command Not Supported on This Product

Description

This product does not support the specified command.

Action

Information only message: this operation is not supported.

Error 102: Switch Not Operational

Description

The request cannot be completed because the switch is not operational.

Action

Refer to the product service manual, and consult your service representative.

Error 115: Invalid Switch Speed

Description

The request cannot be completed because the switch is not capable of operating at the configured speed.

Action

Refer to the product service manual to determine the speed capabilities of the product.

Error 116: Switch Not Capable of 2 Gbps

Description

The request cannot be completed because the switch is not capable of operating at 2.125 gigabits per second (Gbps).

Action

Refer to the product service manual to determine the speed capabilities of the product.

Error 117: Ports Cannot Be Set at Speeds Higher Than the Switch Speed

Description

The request cannot be completed because the requested port speed is faster than the configured switch speed.

Action

Refer to config.switch.speed on page 2-28 and config.port.speed on page 2-9 for information about setting speeds. Ensure that the requested speeds meet all requirements.

Error 201: Change Authorization Request Failed

Description

The switch did not accept the request to make a change to NV-RAM.

Action

Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Error 202: Invalid Change Authorization ID

Description

The switch will not accept a change request from this particular client.

Action

Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Error 203: Another Client Has Change Authorization

Description

Another user is currently making changes to this switch.

Action

Check that all the parameters are correct, and reenter the command.

Error 207: Change Request Failed

Description

The switch did not accept the request.

Action

Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Error 208: Change Request Timed Out

Description

The authorization time allowed to make NV-RAM changes has expired.

Action

Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Error 209: Change Request Aborted

Description

The switch did not accept the request.

Action

Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Error 210: Busy Processing Another Request

Description

A different switch in the fabric was busy processing another request and could not complete the command.

Action

Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Error 211: Duplicate Zone

Description

The entered command tried to add a zone name that already exists in the local zone set.

Action

All zone names must be unique. Delete or rename the zone with the duplicate name before reentering the command; or change the name of the new zone, and reenter the command.

Error 212: Duplicate Zone Member

Description

The entered command tried to add a member that already exists in the zone.

Action

Do nothing if the correct zone member has already been added to the zone; otherwise, add a zone member that is not already in the zone.

Error 213: Number of Zones Is Zero

Description

The config.zoning.activateZoneSet command tried to activate a zone set contained in the work area to the fabric; however, the zone set is empty.

Action

A zone set must have at least one zone to be a valid zone set. Add at least one zone to the zone set, and then reenter the config.zoning.activateZoneSet command to activate the zone set in the work area to the fabric.

Error 214: A Zone Contains Zero Members

Description

The config.zoning.activateZoneSet command tried to activate the zone set contained in the work area to the fabric; however, the zone set contains at least one zone that is empty.

Action

Each zone in the zone set must contain at least one zone member. Add zone members so that each zone has at least one zone member; then reenter the config.zoning.activateZoneSet command to activate the zone set in the work area to the fabric.

Error 215: Zone Set Size Exceeded

Description

The size of the local work-area zone set has outgrown the size supported by the CLI.

Action

Reduce the size of the zone set to meet CLI requirements by doing one or more of the following:

- Reduce the number of zones in the zone set.
- Reduce the number of members in a zone.
- Reduce the length of the zone names.

Error 218: Invalid Port Number

Description

The value specified for the port number is invalid.

Action

Enter a port number within the range supported by the director or switch. Valid values are:

0–15 for the edge switch 2/16

0–31 for the edge switch 2/32

0–63 for the director 2/64

Error 219: Invalid Port Type

Description

The value specified for the port type is invalid.

Action

A port may be configured as an E_Port, a G_Port, or an F_Port. Check that the port is configured appropriately, and reenter the command.

Error 222: Invalid SNMP Community Index

Description

The value specified for the SNMP community index is invalid.

Action

The SNMP community index must be an integer in the range 1–6. Enter an integer in the range 1–6.

Error 223: Unknown Error

Description

The switch did not accept the request.

Action

Contact your service representative.

Error 224: Invalid Argument

Description

The values entered for one or more parameters of the command are invalid. For example, a letter may have been entered where an integer is required.

Action

Refer to Chapter 2 for information about the commands and their parameters. Check that all values for the parameters meet the CLI requirements, and then reenter the command.

Error 225: Argument Does Not Contain All USASCII Characters

Description

The CLI received one or more non-USASCII characters.

Action

Refer to Chapter 2 for information about the command parameters. Check that all parameters are typed correctly, and then resubmit the command.

Error 226: Argument Is Too Long

Description

One or more parameters of the specified command are invalid.

Action

Refer to Chapter 2 for information about the command parameters. Check that all parameters are typed correctly, and resubmit the command.

Error 227: Invalid SNMP Community Name

Description

The value specified for the SNMP community name is invalid.

Action

The community name must not exceed 32 characters in length. Duplicate community names are allowed if the corresponding write authorizations match. Specify a valid SNMP community name, and resubmit the command.

Error 228: Invalid Write Authorization Argument

Description

The writeAuthorization parameter of the config.snmp.addCommunity command does not contain a valid value. For example, the values *true* and *false* are invalid values for this command.

Action

Valid values for the writeAuthorization parameter are *enabled* and *disabled*. Boolean 1 and 0 may be substituted as values. Specify a supported value, and resubmit the command.

Error 229: Invalid UDP Port Number

Description

The udpPortNum parameter of the config.snmp.addCommunity command does not contain a valid value.

Action

Valid values for the udpPortNum parameter are decimal numbers; the default value is 162. Valid values include all legal user datagram protocol (UDP) port numbers. Specify a valid UDP port number, and resubmit the command.

Error 230: Invalid WWN

Description

The WWN parameter does not contain a valid value. For example, the WWN parameter of the config.zoning.addWwnMem or config.zoning.deleteWwnMem command does not contain a value in the correct format.

Action

The world-wide name of the WWN member must be in colon-delimited hexadecimal notation. Enter a valid WWN in the correct format, for example, AA:00:AA:00:AA:00:AA:00, and resubmit the command.

Error 231: Invalid Port Number

Description

The value specified for the portNumber parameter is invalid.

Action

Refer to Chapter 2 for information about the commands with the portNumber parameter. Specify a valid port number value, and resubmit the command.

Error 232: Invalid Domain ID

Description

The value specified for the domainId parameter is invalid. For example, the domainId parameter of the config.switch.prefDomainId command requires an integer in the range 1–31.

Action

Refer to Chapter 2 for information about the commands with the domainId parameter. Specify a valid domain ID value, and resubmit the command.

Error 233: Invalid Member

Description

The value specified for the zoneName parameter (the name of the zone member) is invalid.

Action

Refer to Chapter 2 for information about the commands with the zoneName parameter. Specify a valid name for the zone member, and resubmit the command.

Error 234: Invalid Command

Description

The CLI cannot associate an action with the submitted command. The command may be misspelled, required parameters may be missing, or the request may not be applicable to the branch of the CLI tree from which it was submitted.

Action

Refer to Chapter 2 for the correct command syntax and spelling. Ensure that the command is spelled correctly and that all required parameters are included with the command.

Refer to Navigation of the CLI Command Tree on page 1–6. Ensure that the command has been entered at the right place in the CLI command tree, and then resubmit the command.

Error 235: Unrecognized Command

Description

The CLI does not recognize the submitted command and cannot perform the help (?) command as requested.

Action

Refer to Using the Command Line Interface Help on page 1-12 for information about the help command.

Refer to Chapter 2 for the correct spelling of the submitted command. Ensure that the command is spelled correctly.

Refer to Navigation of the CLI Command Tree on page 1–6. Ensure that the command has been entered at the right place in the CLI command tree, and then resubmit the command.

Error 236: Ambiguous Command

Description

The CLI does not recognize the submitted command. For example, an incomplete command is entered:

```
Root> co
```

The commaDelim command or the config command may have been intended.

Action

Specify the complete name of the command, and resubmit the command.

Error 237: Invalid Zoning Database

Description

An unidentifiable problem with the zone set in the local work area occurred.

Action

Check that all the parameters of the command are valid, and resubmit the command. If the problem persists, clear and then reconstruct the zone set.

Error 238: Invalid Feature Key

Description

The specified feature key is invalid.

Action

Check that the feature key is entered correctly, and resubmit the command. If the problem persists, contact your service representative.

The message that is returned is a string that includes both the error number and the text of the message.

Glossary

This glossary defines terms used in this guide or related to this product and is not a comprehensive glossary of computer terms.

access control
Method of control (with associated permissions) by which a set of devices can access other devices across a network. *See also* persistent binding and zoning.

active zone set
Single zone set that is active in a multi-switch fabric. It is created when you enable a specified zone set. This zone set is compiled by checking for undefined zones or aliases.

agent
Software that processes queries on behalf of an application and returns replies.

alarm
Simple network management protocol (SNMP) message notifying an operator of a network or device problem.

alias server
Fabric software facility that supports multicast group management.

arbitration
Process of selecting one device from a collection of devices that request service simultaneously.

audit log
Log summarizing actions (audit trail) made by the user.

backplane
The backplane provides 48 VDC power distribution and connections for all logic cards.

BB_Credit
See buffer-to-buffer credit.

beaconing
Use of light-emitting diodes on ports, port cards, field-replaceable units, directors, and switches to aid in the fault-isolation process; when enabled, active beaconing causes LEDs to flash for selected components.

BER
See bit error rate.

bidirectional
In Fibre Channel, the capability to simultaneously communicate at maximum speeds (100 Mbps) in both directions over a link.

bit error rate (BER)
Ratio of received bits that contain errors to total of all bits transmitted.

blocked port
Devices communicating with the port are prevented from logging into a director or switch; or communicating with other devices attached to the director or switch. A blocked port continuously transmits the offline sequence.

broadcast
Send a transmission to all N_Ports on a fabric. *See also* multicast.

broadcast frames
Data packet, also known as a broadcast packet, whose destination address specifies all computers on a network.

buffer
Storage area for data in transit. Buffers compensate for differences in processing speeds between devices. *See also* buffer-to-buffer credit.

buffer-to-buffer credit (BB_Credit)
See buffer-to-buffer credit. Indicates the maximum number of frames a port can transmit without receiving a receive ready signal from the receiving device.

call-home
Product feature which requires installation of HP Proactive Service software and enables the HAFM server to automatically transmit system events (failure information) to an HP customer support center. The HP support center server accepts calls from the HAFM server, logs reported events, and can notify one or more support center representatives.

Class F Fibre Channel service
Used by switches to communicate across interswitch links (ISLs) to configure, control, and coordinate a multi-switch fabric.

Class 2 Fibre Channel service
Provides a connectionless (not dedicated) service with notification of delivery or nondelivery between two N_Ports. In-order delivery of frames is not guaranteed.

Class 3 Fibre Channel service
Provides a connectionless (not dedicated) service without notification of delivery or nondelivery between two N_Ports. Also known as datagram.

community profile
Information that specifies which management objects are available to what management domain or SNMP community name.

concurrent maintenance
Ability to perform maintenance tasks, such as removal or replacement of field-replaceable units (FRUs), while normal operations continue without interruption. *See also* nondisruptive maintenance.

configuration data
Configuration data includes: identification data, port configuration data, operating parameters, SNMP configuration, and zoning configuration. A configuration backup file is required to restore configuration data if the control processor (CTP) card in a nonredundant director is removed and replaced.

connectionless
Nondedicated link. Typically used to describe a link between nodes which allows the switch to forward Class 2 or Class 3 frames as resources (ports) allow.

control processor (CTP) card
Circuit card that contains the director microprocessor. The CTP card also initializes hardware components of the system after power-on. A 10 Mbps RJ-45 twisted pair connector is located on the CTP card to connect to an Ethernet LAN and communicate with the HAFM server or a specific management station.

control unit
A device that controls the reading, writing, or displaying of data at one or more input/output units.

CRC
See cyclic redundancy check.

CTP card
See control processor card.

cyclic redundancy check (CRC)
System of error checking performed at both the sending and receiving station using the value of a particular character generated by a cyclic algorithm. When the values generated at each station are identical, data integrity is confirmed.

DASD
Acronym for direct access storage device.

datagram
See Class 3 Fibre Channel service.

default zone
Contains all attached devices that are not members of a separate zone.

destination identifier (D_ID)
Address identifier that indicates the targeted destination of a data frame.

device
Product (server or storage), connected to a managed director or switch, that is not controlled directly by the Product Manager application. *See also* node.

D_ID
See destination identifier.

director
An intelligent, redundant, high-port count Fibre Channel switching device providing any-to-any port connectivity between nodes (end devices) in a switched fabric. Directors send data frames between nodes in accordance with the address information present in the frame headers of those transmissions.

DNS name
Host or node name for a device or managed product that is translated to an internet protocol (IP) address through a domain name server.

domain ID
Number (1 through 31) that uniquely identifies a switch in a multi-switch fabric. A distinct domain ID is automatically allocated to each switch in the fabric by the principal switch.

domain name service (DNS)
See DNS name.

E_D_TOV
See error detect time-out value.

E_Port
See expansion port.

embedded web server
Administrators or operators with a browser-capable PC and Internet connection can monitor and manage a director or switch through an embedded web server interface. The interface provides a GUI similar to Product Manager applications, and supports director and switch configuration, statistics monitoring, and basic operation.

error detect time-out value (E_D_TOV)
User-specified value that defines the time a director or switch waits for an expected response before declaring an error condition.

Ethernet
A widely implemented local area network (LAN) protocol that uses a bus or star topology and serves as the basis for the IEEE 802.3 standard, which specifies the physical and software layers. Baseband LAN allows multiple station access to the transmission medium at will without prior coordination and which avoids or resolves contention.

Ethernet hub
A customer-supplied device used to LAN-connect the HAFM server and managed directors or switches.

event code
Error code that provides the operator with information concerning events that indicate degraded operation or failure of a director or switch.

event log
Record of significant events that have occurred at the director or switch, such as FRU failures, degraded operation, and port problems.

expansion port (E_Port)
Physical interface on a Fibre Channel switch within a fabric, that attaches to an expansion port (E_Port) on another Fibre Channel switch to form a multi-switch fabric.

fabric
Fibre Channel entity that interconnects node ports (N_Ports_ and is capable of routing (switching) Fibre Channel frames using the destination ID information in the Fibre Channel frame header accompanying the frames.

fabric element
An active director, switch, or node in a Fibre Channel switched fabric.

fabric port (F_Port)
Physical interface on a director or switch that connects to an N_Port through a point-to-point full duplex connection.

failover
Automatic and nondisruptive transition of functions from an active FRU that has failed to a backup FRU.

fiber
Physical media types supported by the Fibre Channel specification, such as optical fiber, copper twisted pair, and coaxial cable.

fiber optics
Branch of optical technology concerned with the transmission of light pulses through fibers made of transparent materials such as glass, fused silica, and plastic.

Fibre Channel
Integrated set of standards recognized by the American national Standards Institute (ANSI) which defines specific protocols for flexible information transfer. Logically, a point-to-point serial data channel, structured for high performance.

field-replaceable unit (FRU)
Assembly removed and replaced in its entirety when any one of its components fails.

firmware
Embedded program code that resides and executes on a director or switch.

F_Port
See fabric port.

FRU
See field-replaceable unit.

gateway address
A unique string of numbers (in the format xxx.xx.xxx.xxx) that identifies a gateway on the network.

generic port (G_Port)
Physical interface on a director or switch that can function either as a fabric port (F_Port) or an expansion port (E_Port) depending on the port type to which it connects.

G_Port
See generic port.

high-availability fabric manager (HAFM) application
Application that implements the management user interface for HP Fibre Channel switching products, and as a launching point for Product Manager applications. The application runs locally on the HAFM server or on a remote workstation.

high-availability fabric manager (HAFM) server
Notebook computer shipped with a director or switch that runs the HAFM and Product Manager applications.

HAFM application
See high-availability fabric manager application.

HAFM server
See high-availability fabric manager server.

hardware log
Record of FRU insertions and removals for a director or switch.

HBA
See host bus adapter.

heterogeneous fabric
A fabric with both HP and non-HP products.

high availability
A performance feature characterized by hardware component redundancy and hot-swapability (enabling non-disruptive maintenance). High-availability systems maximize system uptime while providing superior reliability, availability, and serviceability.

hop
Data transfer from one fabric node to another node.

homogeneous fabric
A fabric consisting of only HP products.

hop count
The number of hops a unit of information traverses in a fabric.

host bus adapter (HBA)
Logic card that provides a link between the server and storage subsystem, and that integrates the operating systems and I/O protocols to ensure interoperability.

hot-swapping
Removing and replacing a device's components while the device continues to operate normally.

hub
In Fibre Channel, a device that connects nodes into a logical loop by using a physical star topology.

IML
See initial machine load.

initial machine load (IML)
Hardware reset for a director or switch, initiated by pushing the button on a director CTP card or switch bezel.

initial program load (IPL)
Process of initializing the device and causing the operating system to start. Initiated through a menu in the Product Manager, this option performs a hardware reset on the active CTP only.

internet protocol address
Unique string of numbers (in the format xxx.xxx.xxx.xxx) that identifies a device on a network.

interoperability
Ability to communicate, execute programs, or transfer data between various functional units over a network.

interswitch link (ISL)
Physical E_Port connection between two directors or switches in a fabric.

IP address
See internet protocol address.

IPL
See initial program load.

ISL
See interswitch link.

jumper cable
Optical cable that provides physical attachment between two devices or between a device and a distribution panel. *Contrast with* trunk cable.

latency
When used in reference to a Fibre Channel switching device, latency refers to the amount of time elapsed between receipt of a data transmission at a switch's incoming F_Port (from the originating node port) to retransmission of that data at the switch's outgoing F_Port (to the destination N_Port). The amount of time it takes for data transmission to pass through a switching device.

LIN
See link incident.

link incident (LIN)
Interruption to a Fibre Channel link due to loss of light or other cause.

logical unit number (LUN)
In Fibre Channel addressing, a logical unit number is a number assigned to a storage device which, in combination with the storage device's node port's world wide name, represents a unique identifier for a logical device on a storage area network.

loopback plug
In a fiber optic environment, a type of duplex connector used to wrap the optical output signal of a device directly to the optical input.

loopback test
Test that checks attachment or control unit circuitry, without checking the mechanism itself, by returning the output of the mechanism as input.

LUN
See logical unit number.

MAC address
See Media Access Control address.

maintenance port
Connector on the director or switch where a PC running an ASCII terminal emulator can be attached or dial-up connection made for specialized maintenance support.

managed product
Hardware product that can be managed with the HAFM application. For example, the director 2/64 is a managed product. *See also* device.

management information base (MIB)
Related set of software objects (variables) containing information about a managed device and accessed via SNMP from a network management station.

Management Services application
Software application that provides back-end product-independent services to the HAFM application. Management Services runs only on the HAFM server, and cannot be downloaded to remote workstations.

management session
A management session exists when a user logs on to the HAFM application. The application can support multiple concurrent management sessions. The user must specify the network address of the HAFM server at logon time.

Media Access Control (MAC) address
Hardware address of a node (device) connected to a network.

MIB
See management information base.

multicast
Delivery of a single transmission to multiple destination N_Ports. Can be one to many or many to many. All members of the group are identified by one IP address. *See also* broadcast.

multi-switch fabric
Fibre Channel fabric created by linking more than one director or switch in a fabric.

name server
Program that translates names from one form into another. For example, the domain name service (DNS) translates domain names into IP addresses.

name server zoning
N_Port access management that allows N_Ports to communicate if and only if they belong to a common name server zone.

network address
Name or address that identifies a managed product on a transmission control protocol/internet protocol (TCP/IP) network. The network address can be either an IP address in dotted-decimal notation (containing four three-digit octets in the format xxx.xxx.xxx.xxx), or a domain name (as administered on a customer network).

nickname
Alternate name assigned to a world wide name for a node, director, or switch in a fabric.

node
In Fibre Channel terminology, node refers to an end device (server or storage device) that is or can be connected to a switched fabric.

node port (N_Port)
Physical interface within an end device which can connect to an F_Port on a switched fabric or directly to another N_Port (in point-to-point communications).

nondisruptive maintenance
Ability to service FRUs (including maintenance, installation, removal and replacement) while normal operations continue without interruption. *See also* concurrent maintenance.

N_Port
See node port.

offline sequence (OLS)
Sequence sent by the transmitting port to indicate that it is attempting to initialize a link and has detected a problem in doing so.

OLS
See offline sequence.

optical cable
Fiber, multiple fibers, or a fiber bundle in a structure built to meet optical, mechanical, and environmental specifications. *See also* jumper cable, optical cable assembly, and trunk cable.

out-of-band management
Transmission of management information using frequencies or channels (Ethernet) other than those routinely used for information transfer (Fibre Channel).

password
Unique string of characters known to the computer system and to a user who must specify it to gain full or limited access to a system and to the information stored within it.

persistent binding
A form of server-level access control that uses configuration information to bind a server to a specific Fibre Channel storage volume (or logical device) using a unit number.

port
Receptacle on a device to which a cable leading to another device can be attached.

port card
Field-replaceable hardware component that provides the port connections for fiber cables and performs specific device-dependent logic functions.

port card map
Map showing numbers assigned to each port card by card slot.

port name
Name that the user assigns to a particular port through the Product Manager.

POST
See power-on self test.

power-on self test (POST)
Series of self-tests executed each time the unit is booted or reset.

preferred domain ID
Domain ID that a director or switch is assigned by the principal switch in a switched fabric. The preferred domain ID becomes the active domain ID except when configured otherwise by the user.

principal switch
The director or switch that allocates domain IDs to itself and to all other switches in a fabric. There is always one principal switch in a fabric. If a switch is not connected to any other switches, it acts as its own principal switch.

Product Manager application
Application that implements the management user interface for a specified director 2/64, edge switch 2/16, or edge switch 2/32. When a product instance is opened from the HAFM application's Product View, the Product Manager application is invoked.

R_A_TOV
See resource allocation time-out value.

redundancy
Performance characteristic of a system or product whose integral components are backed up by identical components to which operations will automatically failover in the event of a component failure. Redundancy is a vital characteristic of virtually all high-availability (24 hours per day, seven days per week) computer systems and networks.

remote notification
A process by which a system is able to inform remote users and/or workstations of certain classes of events that occur on the system. E-mail notification and the configuration of SNMP trap recipients are two examples of remote notification programs that can be implemented on director-class switches.

remote user workstation
Workstation, such as a PC, using the HAFM and Product Manager applications that can access the HAFM server over a LAN connection.

resource allocation time-out value (R_A_TOV)
User-specified value used to time out operations that depend on the maximum possible time that a frame could be delayed in a fabric and still be delivered.

RFI
Acronym for radio frequency interface.

SAN
See storage area network.

SBAR
See serial crossbar assembly.

segmented E_Port
E_Port that has ceased to function as an E_Port within a multi-switch fabric due to an incompatibility between the fabrics that it joins. *See also* expansion port.

serial crossbar (SBAR) assembly
Responsible for Fibre Channel frame transmission from any director port to any other director port. Connections are established without software intervention.

SFP
Acronym for small form factor pluggable (a type of Fibre Channel connector). *See also* universal port module card.

simple Network management protocol (SNMP)
A protocol that specifies a mechanism for network management that is complete, yet simple. Information is exchanged between agents, which are the devices on the network being managed, and managers, which are the devices on the network through which the management is done.

SNMP
See simple network management protocol.

SNMP community
Also known as SNMP community string. An SNMP community is a cluster of managed products (in SNMP terminology, hosts) to which a server or managed product running the SNMP agent belongs.

SNMP community name
The name assigned to a given SNMP community. Queries from an SNMP management station to a device running an SNMP agent will only elicit a response if those queries are addressed with the correct SNMP community name.

storage area network (SAN)
A high-performance data communications environment that interconnects computing and storage resources so that the resources can be effectively shared and consolidated.

subnet mask
Used by a computer to determine whether another computer with which it needs to communicate is located on a local or remote network. The network mask depends upon the class of networks to which the computer is connecting. The mask indicates which digits to look at in a longer network address and allows the router to avoid handling the entire address.

switch
An intelligent but nonredundant, low-port count Fibre Channel switching device providing any-to-any port connectivity between nodes (end devices) in a switched fabric. Switches send data frames between nodes in accordance with the address information present in the frame headers of those transmissions.

switchover
Changing a backup FRU to the active state, and the active FRU to the backup state.

TCP/IP
See transmission control protocol/internet protocol.

topology
Logical and/or physical arrangement of stations on a network.

transmission control protocol/internet protocol (TCP/IP)
A suite of communication protocols used to connect host systems to the Internet. *See also* network address.

trap
Unsolicited notification of an event originating from an SNMP managed device and directed to an SNMP network management station.

trap host
SNMP management workstation that is configured to receive traps.

trunk cable
Cable consisting of multiple fiber pairs that do not directly attach to an active device. This cable usually exists between distribution panels. *See also* optical cable, c*ontrast with* jumper cable.

unblocked port
Devices attached to an unblocked port can login to the director or switch and communicate with devices attached to any other unblocked port.

unicast
Communication between a single sender and a single receiver over a network. Compare to *multicast* (communication between any sender and the nearest of a group of receivers).

universal port module (UPM) card
Each director 2/64 UPM card provides four 2.125 Gbps Fibre Channel connections through duplex small form factor (SFF) pluggable fiber-optic transceivers.

UPM card
See universal port module card.

vital product data (VPD)
System-level data stored by the backplane in the electrically erasable programmable read-only memory. This data includes serial numbers and identifies the manufacturer.

VPD
See vital product data.

world wide name (WWN)
Eight-byte address that uniquely identifies a switch, or a node (end device) on global networks.

WWN
See world wide name.

zone
Set of devices that can access one another. All connected devices may be configured into one or more zones. Devices in the same zone can see each other. Those devices that occupy different zones cannot.

zone member
Specification of a device to be included in a zone. A zone member can be identified by the port number of the director or switch to which it is attached or by its world wide name. In multi-switch fabrics, identification of end-devices/nodes by world wide name is preferable.

zone set
See zone.

zoning
Grouping of several devices by function or by location. All devices connected to a connectivity product, such as the director or switch, may be configured into one or more zones. *See also* zone.

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