

hp StorageWorks

CLI reference guide for directors and edge switches

Part Number: AA-RQ7AC-TE

Third Edition (January 2003)

This guide covers the essentials of using a command line interface (CLI) to manage the Hewlett-Packard (HP) StorageWorks Director and Edge Switches. Also included are CLI commands, syntax, purpose, and parameters.



i n v e n t

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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 Director 2/140
- HP StorageWorks Edge Switch 2/16.
- HP StorageWorks Edge Switch 2/24.
- HP StorageWorks Edge Switch 2/32.
- *High Availability 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

For a list of corresponding documentation, see the Related Documents section of the Release Notes that came with this product.

For the latest information, documentation, and firmware releases, please visit the following StorageWorks website:

<http://h18006.www1.hp.com/storage/saninfrastructure.html>

For information about Fibre Channel Standards, visit the Fibre Channel Industry Association website, located at <http://www.fibrechannel.org>.

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	<i>Italics</i>
User input, command names, system responses (output and messages)	Monospace font COMMAND NAMES are uppercase unless they are case sensitive
Variables	<i>Monospace, italic font</i>
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>.

Introduction

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

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Command Line Interface Overview

The Command Line Interface (CLI) is a feature that provides an alternative to the HP High Availability Fabric Manger (HAFM) and Embedded Web Server (EWS) interface products for Director and Switch 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 Edge 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.

The purpose of the CLI is to automate management of a large number of Directors and Edge 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.

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 *HAFM* application or *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 1–7](#). 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.
	Delete	Backspace one character and delete the character.
<NL>	New Line	Pass a completed line to the parser.
<SP>	Space	Used to separate keywords.

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

Character Sequence	Common Name	Action or Description
#	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.
^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	
		enterpriseFabMode	
		ficonms	
		OpenSysMS	
		show	
	ip -----	ethernet	
		show	
	port -----	blocked	
		extDist	
		fan	
		name	
		speed	
		type	
		show	
	security -----	fabricBinding -----	activatePending
			addMember
			clearMemList
			deleteMember
			replacePending
			setFabBindState
			showActive
			showPending
	security -----	portBinding -----	bound
			wwn

Table 1–2: CLI Command Tree (Continued)

			show
		switchBinding -----	addMember
			deleteMember
			setSwitchBindState
			show
		userRights -----	administrator
			operator
			show
	snmp -----	addCommunity	
		authTraps	
		deleteCommunity	
		show	
	switch -----	bbCredit	
		domainRSCN	
		edTOV	
		insistDomainId	
		interopMode	
		prefDomainId	
		priority	
		raTOV	
		rerouteDelay	
		speed	
		show	
	system -----	contact	
		date	
		description	
		location	
		name	
		show	
	zoning -----	setDefZoneState	

Table 1–2: CLI Command Tree (Continued)

		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		
	clearStats		
	errors		
	link		
	traffic		
show -----	eventLog		
	frus		

Table 1–2: CLI Command Tree (Continued)

	ip -----	ethernet	
	loginServer		
	nameServer		
	port -----	config	
		info	
		nodes	
		status	
		technology	
	security -----	fabricBinding	
		portBinding	
		switchBinding	
	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 Edge 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 Edge 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 Edge 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 Edge Switch.

Description

This command logs out the single Telnet client connected to a Director or Edge 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. The default format is tabular.

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> config
Error 234: Invalid Command
```

- An error associated with a fabric, Director, or Edge 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 beaoning<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 beaoning<CR>
Root> maint system beacon true<CR>
or
Root> maint system beacon true<CR>
Root> # Turn on beaoning<CR>
```

NOTE: Comments of over 200 characters in length may cause unpredictable system behavior. Limit comments to 200 characters per line.

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 Edge 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).

Telnet access is enabled by default. Any changes to the enabled state of the Telnet server are retained through system resets and power cycles.

Ethernet Connection Loss

If the Ethernet cable is disconnected from a Director or Edge 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.

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.

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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 be 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.

In general, the `config` naming commands (except for the `config.zoning` commands) use the USASCII character set. All of the characters in this 128-character set (the first 7-bit subset of the ISO-8859-1 Latin-1 character set) are valid. Any exceptions are noted in the specific command descriptions.

config.features.enterpriseFabMode

Syntax

```
enterpriseFabMode enterpriseFabModeState
```

Purpose

This command sets the Enterprise Fabric mode state for the fabric. The SANtegrity feature key must be installed to activate the Enterprise Fabric mode state.

Parameters

This command has one parameter:

enterpriseFabModeState Specifies whether enterpriseFabMode is active. Valid values are `activate` and `deactivate`. Boolean 1 and 0 may be substituted as values.

Command Example

```
Root> config features enterpriseFabMode 1
```

config.features.ficonms

Syntax

```
ficonms ficonmsState
```

Purpose

This command sets the enabled state of the FICON Management Server. The FICON Management Server feature key must be installed in order to enable the FICON Management Server State. (The Edge Switch 2/24 does not accept this command.)

Parameters

This command has one parameter:

<i>ficonmsState</i>	Specifies whether the FICON Management Server is enabled. Valid values are <code>enable</code> and <code>disable</code> . Boolean 1 and 0 may be substituted as values.
---------------------	---

Command Example

```
Root> config features ficonms 1
```

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. The Switch can be either offline or online when the command is executed.

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.OpenSysMS

Syntax

```
OpenSysMS osmsState
```

Purpose

This command sets the enabled state of the Open Systems Management Server. The Open Systems Management Server feature key must be installed in order to enable the OSMS State.

Parameters

This command has one parameter:

<i>osmsState</i>	Specifies whether the Open Systems Management Server is enabled. Valid values are <code>enable</code> and <code>disable</code> . Boolean 1 and 0 may be substituted as values.
------------------	--

Command Example

```
Root> onfig features OpenSysMS 1
```

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 properties.

Installed	The feature set installed using a feature key. Only installed keys are displayed.
Feature Set	
Feature	Individual features within each set. In many cases, there is only one feature within each feature set.
State	The state of the individual feature. Fabric-wide features are displayed as Active/Inactive. Switch-centric features are displayed as Enabled/Disabled.

Output Example

The output from the `config.features.show` command displays as follows.

Installed Feature Set	Feature	State
-----	-----	-----
Open Systems Management Server	OSMS	Enabled
Flex Ports	8 Flex Ports	Enabled
SANtegrity	Fabric Binding	Active
SANtegrity	Switch Binding	Enabled
SANtegrity	Enterprise Fabrics	Active

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:

<i>ipAddress</i>	Specifies the new IP address for the Director or Edge Switch. The address must be entered in dotted decimal format (for example, 10.0.0.0).
<i>gatewayAddress</i>	Specifies the new gateway address for the Ethernet interface. The address must be entered in dotted decimal format (for example, 0.0.0.0).
<i>subnetMask</i>	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:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
<i>blockedState</i>	Specifies the blocked state for the port. Valid values are <code>true</code> and <code>false</code> . 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. (The Edge Switch 2/24 does not accept this command.)

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 1 gigabits per second (Gbps) port.

Parameters

This command has two required parameters:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–5 for the Edge Switch 2/16 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
<i>extDistOn</i>	Specifies the extended distance state for the port. Valid values are <i>true</i> and <i>false</i> . 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.fan

Syntax

```
fan portNumber fanOn
```

Purpose

This command sets the fabric address notification (FAN) state for a port (Edge Switch 2/24 only). This configuration can be applied to any port regardless of its current configuration. The FAN value is applied at the time the port is configured and operated in a loop.

Parameters

This command has two required parameters:

portNumber Specifies the port number. Valid values are:

0–23 for the Edge Switch 2/24

fanOn Specifies the FAN state for the port. Valid values are `true` and `false`.

Boolean 1 and 0 may be substituted as values.

Command Examples

```
Root> config port fan 4 1
```

config.port.name

Syntax

```
name portNumber "portName"
```

Purpose

This command sets the name for a port.

Parameters

This command has two required parameters:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
<i>portName</i>	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 or 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 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:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
<i>portSpeed</i>	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. On an Edge Switch 2/24, a port can also be an Fx_Port or Gx_Port. The port configurations function as follows:

- F_Port—cannot be used as an interswitch link, but may attach to a device with an N_Port.
- E_Port—only other Switch may attach to this type of port.
- G_Port—either a device or another Switch may attach to this type of port.
- Fx_Port — allows Arbitrated Loop operation in addition to the functionality of an F_Port. (Edge Switch 2/24 only.)
- Gx_Port—allows Arbitrated Loop operation in addition to the functionality of an F_Port or an E_Port. (Edge Switch 2/24 only.)

Parameters

This command has two required parameters:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	---

portType Specifies the type of the port. Valid values are eport, fport, and gport, fport (Edge Switch 2/24 only) gport (Edge Switch 2/24 only).

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:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	---

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 <code>true</code> and <code>false</code> . This field is not valid for the Edge Switch 2/24.
FAN	The fabric address notification (FAN) state. Valid values are <code>true</code> and <code>false</code> . (Edge Switch 2/24 only.)
Type	The port type. Valid values are <code>F Port</code> , <code>E Port</code> , <code>G Port</code> , <code>Fx Port</code> (Edge Switch 2/24 only), and <code>Gx Port</code> (Edge Switch 2/24 only).
Speed	The port speed. Valid values are <code>1 Gb/sec</code> , <code>2 Gb/sec</code> , and <code>Negotiate</code> .

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.fabricBinding

Note that the `config.security.fabricBinding` commands function in a different way from most CLI commands, which are single action commands that take effect immediately. The first Fabric Binding command entered invokes a work-area editor. The commands take effect on a temporary copy of a Fabric Member List 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 Fabric Member List can occur on the temporary copy in the work area, it is possible, however unlikely, that the copy of the list encounters no errors until the list is activated to the fabric.

config.security.fabricBinding.activatePending

Syntax

```
activatePending
```

Purpose

This command activates the fabric binding configuration contained in the pending work area to the fabric.

NOTE: This command takes effect immediately. The CLI verifies the list before activating it to the fabric and adds the managed Switch to the list if it is not already present.

Parameters

This command has no parameters:

Command Examples

```
Root> config security fabricBinding activatePending
```

config.security.fabricBinding.addMember

Syntax

```
addMember wnn domainId
```

Purpose

This command adds a new member to the Fabric Member List in the pending fabric binding work area. The number of entries is limited to the maximum available domain ID's for the fabric (31).

NOTE: Changes from this command are not activated to the fabric until the `activatePending` command is issued.

Parameters

This command has two parameters:

<i>wwn</i>	Specifies the World Wide Name (WWN) of the member to be added to the fabric membership list. The value of the WWN must be in colon-delimited hexadecimal notation (for example, AA:00:AA:00:AA:00:AA:00).
<i>domainId</i>	The domain ID of the member to be added to the fabric membership list. Valid domain ID's range from 1 to 31.

Command Examples

```
Root> config security fabricBinding addMember  
AA:99:23:23:08:14:88:C1 2
```

config.security.fabricBinding.clearMemList

Syntax

```
clearMemList
```

Purpose

This command clears the fabric membership list for the pending fabric binding working area.

NOTE: This information is not saved to the fabric until the `activatePending` command is issued. When the list is cleared, the CLI automatically adds the managed Switch to the fabric membership list.

Parameters

This command has no parameters:

config.security.fabricBinding.deleteMember

Syntax

```
deleteMember wwn domainId
```

Purpose

This command removes a member from the Fabric Member List in the pending fabric binding work area.

NOTE: Changes are not activated to the fabric until the `activatePending` command is issued.

Parameters

This command has two parameters:

<i>wwn</i>	Specifies the WWN of the member to be removed from the fabric membership list. The value of the WWN must be in colon-delimited hexadecimal notation (for example, AA:00:AA:00:AA:00:AA:00).
<i>domainId</i>	The domain ID of the member to be removed from the fabric membership list. Valid domain ID's range from 1 to 31.

Command Examples

```
Root> config security fabricBinding deleteMember  
AA:99:23:23:08:14:88:C1
```

```
Root> config security fabricBinding deleteMember 2
```

config.security.fabricBinding.replacePending

Syntax

```
replacePending
```

Purpose

This command replaces the pending working area with the fabric binding configuration that is currently loaded on the fabric.

Parameters

This command has no parameters:

Command Examples

```
Root> config security fabricBinding replacePending
```

config.security.fabricBinding.setState

Syntax

```
setState fabricBindingState
```

Purpose

This command sets the fabric binding state for the pending fabric binding configuration work area.

NOTE: This state is not saved to the fabric until the `activatePending` command is issued.

Parameters

This command has one parameter:

<i>fabricBindingState</i>	Specifies the fabric binding state for the pending fabric binding configuration work area. Valid values are: <i>inactive</i> — Deactivates fabric binding. Switches and Directors are allowed to join the fabric without restriction. The fabric membership list is empty in this state, and as such, the fabric membership list is cleared when this state is requested. <i>restrict</i> — Activates fabric binding and restricts connections. Only Switches identified in the fabric membership list may join the fabric in this state. The fabric membership list is automatically populated with devices attached prior to activation, but all new members must be manually added before connecting. The Switch must be online to complete this request.
---------------------------	--

Command Examples

```
Root> config security fabricBinding setstate restrict
```

config.security.fabricBinding.showActive

Syntax

```
showActive
```

Purpose

This command displays the fabric binding configuration saved on the fabric. It performs the same function as `show.security.fabricBinding`.

Parameters

This command has no parameters:

Output

This command displays the following fabric binding configuration data:

Fabric Binding State	The active fabric binding state: Inactive or Active Restricting
Fabric Membership List	The active fabric membership list.

Output Example

The output from the `config.security.fabricBinding.showActive` command displays as follows:

```
Fabric Binding State:  Active Restricting
Domain 1  (00:11:22:33:44:55:66:77)
Domain 2  (88:99:AA:BB:CC:DD:EE:FF)
Domain 14 (11:55:35:45:24:78:98:FA)
```

config.security.fabricBinding.showPending

Syntax

```
showPending
```

Purpose

This command displays the fabric binding configuration in the pending working area and has not yet been activated to the fabric. If no changes have been made to the pending environment, the CLI displays the Active membership list.

Parameters

This command has no parameters.

Output

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

Fabric Binding State The active fabric binding state: Inactive or
Active Restricting

Fabric Membership List The active fabric membership list.

Output Example

The output from the `config.security.fabricBinding.showActive` command displays as follows:

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:

<i>portNumber</i>	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 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
<i>portBindingState</i>	Specifies the port binding state as active or inactive. Valid values are <code>true</code> and <code>false</code> . <code>true</code> sets the port binding to active. The specified port will be bound to the WWN configured with the <code>config.security.portBinding.wwn</code> command. If no WWN has been configured, no devices can log in to that port. <code>false</code> 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.fabricBinding.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
- 0–23 for the Edge Switch 2/24
- 0–31 for the Edge Switch 2/32
- 0–63 for the Director 2/64
- 0–127 and 132–144 for the Director 2/140

boundWwn Specifies the WWN of the device that is being bound to the specified port. The value must be entered in colon-delimited hexadecimal 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:

<i>portNumber</i>	Specifies the port number for which the port binding configuration will be shown. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	---

Command Example

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

Output

The port binding configuration data 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.switchBinding

config.security.switchBinding.addMember

Syntax

```
addMember wwn
```

Purpose

This command adds a new member to the Switch Membership List. A maximum number of 256 members may be added to the Switch membership list.

Parameters

This command has one parameter:

<i>wwn</i>	Specifies the Switch or N-Port device WWN of the member to be added to the Switch membership list. The value of the WWN must be in colon-delimited hexadecimal notation (for example, AA:00:AA:00:AA:00:AA:00)
------------	--

Command Examples

```
Root> config security switchBinding addMember  
AA:99:23:23:08:14:88:C1
```

config.security.deleteMember

Syntax

```
deleteMember wwn
```

Purpose

This command removes a member from the Switch Member List. The user cannot remove a member that is currently logged into the Switch.

Parameters

This command has one parameter:

wwn Specifies the Switch or N-Port device WWN of the member to be removed from the Switch membership list. The value of the WWN must be in colon-delimited hexadecimal notation (for example, AA:00:AA:00:AA:00:AA:00). The user may also enter all for this argument to clear the Switch membership list completely. Note that the user cannot clear a WWN that is currently logged into the Switch.

Command Examples

```
Root> config security switchBinding deleteMember  
AA:99:23:23:08:14:88:C1
```

config.security.switchBinding.setState

Syntax

```
setState switchBindingState
```

Purpose

This command removes a member from the Switch Member List. The user cannot remove a member that is currently logged into the Switch.

Parameters

This command has one parameter:

switchBindingState Sets the Switch binding state for the Switch. Valid values are:

disable — Disable Switch binding. Devices (servers, storage, and other Switches) are allowed to connect to the Switch without restrictions.

eRestrict — Enable Switch binding and restrict E_Port connections. E_Ports are prevented from forming ISL connections unless explicitly identified in the Switch membership list. F_Port connections are allowed without restriction.

fRestrict — Enable Switch binding and restrict F_Port connections. Server and (or) storage devices are prevented from forming F_Port connections with the Switch unless explicitly identified in the Switch membership list. E_Ports are allowed to form ISL connections without restriction.

allRestrict — Enable Switch binding and restrict E_Port and F_Port connections. Both E_Ports and F_Ports prohibit connections with all devices unless explicitly identified in the Switch membership list.

Command Examples

```
Root> config security switchBinding setState allRestrict
```

config.security.switchBinding.show

Syntax

```
show
```

Purpose

This command displays the Switch binding configuration.

Parameters

This command has no parameters.

Output

This command displays the following Switch binding configuration data:

<i>switchBindingState</i>	Disabled, Enabled and Restricting F_Ports, Enabled and Restricting E_Ports, or Enabled and Restricting All Ports.
<i>Switch Membership List</i>	The Switch membership list saved on the Switch.

Output Example

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

```
Switch Binding State:  Enabled and Restricting E Ports
00:11:22:33:44:55:66:77
88:99:AA:BB:CC:DD:EE:FF
11:55:35:45:24:78:98:FA
```

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:

<i>username</i>	Specifies the new user name for operator-level login. Default is <i>Operator</i> . 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.
<i>password</i>	Specifies the password for operator-level login. Default is <i>password</i> . 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.

<i>commIndex</i>	Specifies the community to be created or edited. Valid values are integers in the range 1–6.
<i>commName</i>	Specifies the community name of the community specified by <i>commIndex</i> . 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 <i>writeAuthorization</i> values must match.
<i>writeAuthorization</i>	Specifies the write authorization state of the community. Valid values are <i>enabled</i> and <i>disabled</i> . Boolean 1 and 0 may be substituted as values.
<i>trapRecipient</i>	Specifies the trap recipient. Values must be 4 bytes in dotted-decimal format.
<i>udpPortNum</i>	Specifies the user datagram protocol (UDP) port number to which the Director sends traps for each recipient. The value can be a decimal number or the default, which 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 Edge 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. (The Edge Switch 2/24 does not accept this command.)

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.domainRSCN

Syntax

```
domainRSCN domainRSCNState
```

Purpose

This command sets the domain RSCN state for the Switch. The Switch can be either offline or online when this command is executed.

Parameters

This command has one parameter:

domainRSCNState Specifies whether the domain RSCN state is enabled. Valid values are `enable` and `disable`. Boolean 1 and 0 may be substituted as values.

Command Example

```
Root> config switch domainRSCN 1
```

config.switch.insistDomainId

Syntax

```
insistDomainId insistentDomainIdState
```

Purpose

This command sets the insistent domain ID state for the Switch.

Parameters

This command has one parameter:

<i>insistentDomainIdState</i>	Specifies whether the insistent domain ID state is enabled. Valid values are <code>enable</code> and <code>disable</code> . Boolean 1 and 0 may be substituted as values.
-------------------------------	---

Command Example

```
Root> config switch insistDomainId 1
```

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 interopMode
```

Purpose

This command sets the interoperability mode for the Switch. The Switch must be offline to complete this command.

Description

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

Parameters

This command has one parameter:

<i>interopMode</i>	Specifies the interoperability mode. Valid values are:
	<ul style="list-style-type: none">• mcdata (<i>for Homogenous Fabric mode</i>)• open (<i>for Open Fabric 1.0 mode</i>)

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:

<i>domainId</i>	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.

NOTE: This command is only applicable for the Director 2/64. Edge Switches and the Director 2/140 cannot change speed.

Description

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

A Switch can be configured to operate at 1.0625 Gbps 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 1.0625 Gbps) or 2g (for 2.125 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.

Description

This Switch can be either offline or online when this command is executed.

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. (This parliamentary is not valid for the Edge Switch 2/24.)
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.
Insistent Domain Id	When enabled, ensures that the embedded firmware cannot change a Switch's preferred domain ID.
Domain RSCN	When enabled, allows domain RSCNs to be sent to registered members of the fabric

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
Insistent Domain Id: Disabled
Domain RSCN:        Enabled
```

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 Edge 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 Edge 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 Edge 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 Edge 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.

NOTE: Port numbers cannot be used for zone members if the interoperability mode for the Switch or Director is set to Open Fabric 1.0 mode. In this case, you must use node WWNs as zone members.

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:

<i>defaultZoneState</i>	Specifies whether the default zone is enabled. Valid values are <code>true</code> and <code>false</code> . 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
```

NOTE: If the interoperability mode for the Switch or Director is set to Open Fabric 1.0 mode when the zone is activated, any zone members specified by port number are ignored.

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 deactivateZoneSet
```

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:

```
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789$-^_
```

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:

```
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz  
0123456789$-^_
```

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:

<i>zoneName</i>	Specifies the name of the zone.
<i>wwn</i>	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.

NOTE: Port numbers cannot be used for zone members if the interoperability mode for the Switch or Director is set to Open Fabric 1.0 mode.

Description

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

Parameters

This command has three parameters:

<i>zoneName</i>	Specifies the name of the zone.
<i>domainId</i>	Specifies the domain ID of the member to be added to the zone. Valid values are in the range 1–31.
<i>portNumber</i>	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 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140

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 hexadecimal 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

0–23 for the Edge Switch 2/24

0–31 for the Edge Switch 2/32

0–63 for the Director 2/64

0–127 and 132–144 for the Director 2/140

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:
ABCDEFGHIJKLMNOPQRSTUVWXYZabcde
fghijklmnopqrstuvwxyz\$-^_
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

0–23 for the Edge Switch 2/24

0–31 for the Edge Switch 2/32

0–63 for the Director 2/64

0–127 and 132–144 for the Director 2/140

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:

<i>portNumber</i>	Specifies the port number to be reset. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	--

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 Edge Switch. For information about the default values, refer to the service manual for your Director or Edge 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 be 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:

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

perf.class2

Syntax

```
class2 portNumber
```

Purpose

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

Parameters

This command has one parameter:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	--

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

0–23 for the Edge Switch 2/24

0–31 for the Edge Switch 2/32

0–63 for the Director 2/64

0–127 and 132–144 for the Director 2/140

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

0–23 for the Edge Switch 2/24

0–31 for the Edge Switch 2/32

0–63 for the Director 2/64

0–127 and 132–144 for the Director 2/140

all for every port on the Director or Edge 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:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	--

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:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	--

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 Edge 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 Edge Switch.
LIPS In	The number of LIPS generated on this Switch loop port.

- LIPS Out The number of times the port has detected a link error resulting from an invalid link state transition or timeout.
- 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:

<i>portNumber</i>	Specifies the port number. Valid values are: 0–15 for the Edge Switch 2/16 0–23 for the Edge Switch 2/24 0–31 for the Edge Switch 2/32 0–63 for the Director 2/64 0–127 and 132–144 for the Director 2/140
-------------------	--

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 be 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 Edge 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). Severe—Unit not operational. The causes are either the Switch contains no operational SBAR cards or the system shutdowns due to CTP thermal threshold violations.
FRU	Info—Unit operational (information only). The FRU and FRU position, where applicable.
Event Data	The 32-byte hexadecimal 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.features

Syntax

```
features
```

Purpose

This command displays a table of all installed feature sets and their states. The output is exactly the same as the output to the `config.features.show` command.

Parameters

This command has no parameters.

Command Example

```
Root> show features
```

Output

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

Installed Feature Set	The feature set installed using a feature key. Only installed keys are displayed.
Feature	Individual features within each set. In many cases, there is only one feature within each feature set.
State	The state of the individual feature. Fabric-wide features are displayed as <i>Active/Inactive</i> . Switch-centric features are displayed as <i>Enabled/Disabled</i> .

Output Example

The output from the `show.features` command displays as follows:

Installed Feature Set	Feature	State
-----	-----	-----
Open Systems Management Server	OSMS	Enabled
Flex Ports	8 Flex Ports	Enabled
SANtegrity	Fabric Binding	Active
SANtegrity	Switch Binding	Enabled
SANtegrity	Enterprise Fabrics	Active

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. <ul style="list-style-type: none"> If a FRU is not installed on an Edge Switch 2/16, 2/32, or an Director 2/64, the output in this column is <code>NotInstalled</code>. If a FRU is not installed on a Edge Switch 2/24 or an Director 2/140, the output in this column is the name of the missing FRU or <code>Unknown</code>.
Position	The relative position of the FRU, that is, its slot.
State	The state of the FRU. Values are: <ul style="list-style-type: none"> <code>Active</code>—the current module is active. <code>Backup</code>—this module is not currently being used, but it is available for immediate failover. <code>Failed</code>—the current module is failed.
Serial Num	The serial number of the FRU. (This field is blank for the power supply modules of the Edge Switch 2/24.)
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 <code>config.ip.ethernet</code> command.
Gateway Address	The gateway address for the Ethernet adapter as set in the <code>config.ip.ethernet</code> command.
Subnet Mask	The subnet mask for the Ethernet adapter as set in the <code>config.ip.ethernet</code> 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.

NOTE: It is possible to have more than one device per port for any public loop devices attached to an FL Port.

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.

NOTE: It is possible to have more than one device per port for any public loop devices attached to an FL Port.

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. One or more numbers display in this field. 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.nameServerExt

Syntax

```
nameServerExt
```

Purpose

This command displays extended information from the name server database for devices attached to this Switch. The command provides symbolic nameserver information, as well as the same information as the `show.nameServer` command. Multiple devices per port are possible for any public loop device attached to an FL Port.

NOTE: Because it contains symbolic nameserver information that can be lengthy, the CLI output wraps several times per node. For this reason, this command is supported only in comma-delimited mode.

Parameters

This command has no parameters.

Command Example

```
Root> show nameServerExt
```

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. One or more numbers display in this field. The numbers in this field correspond to the list in the output example for show.nameServer on page 2-110.

SymNodeName 255-character representation of the Symbolic Node Name.
SymPortName 255-character representation of the Symbolic Port Name.

Output Example

The output from the `show.nameServerExt` command displays as follows.

```
Type, Port Id, Port Name, Node Name, COS, FC4 Types, SymNodeName,  
SymPortName,  
N, 010400, 00:11:22:33:44:55:00:77, 20:11:22:33:44:55:66:77, 2-3, 2,  
Node Name A, Port Name A,  
N, 010500, 00:11:22:33:44:55:01:77, 20:11:22:33:44:55:66:77, 2-3, 0,  
This Is Symbolic Node Name B, Symbolic Port Name B Is Slightly  
Longer  
N, 010600, 00:11:22:33:44:55:66:02, 20:11:22:33:44:55:66:77, 2-3, 2, ,  
,  
FL, 000001, 00:11:22:33:44:55:66:03, 20:11:22:33:44:55:66:77, 2, 0,  
Loop Node 1, Loop Port 7  
FL, 000002, 00:11:22:33:44:55:66:04 20:11:22:33:44:55:66:77, 3, 2,  
Loop Node 2, Loop Port 7,
```

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 <code>config.port.name</code> command.
Blocked	The blocked state of the port as set in the <code>config.port.blocked</code> command.
Ext Dist	The extended distance state as set in the <code>config.port.extDist</code> command. (This does not apply to the Edge Switch 2/24.)
FAN	The configured fabric address notification (FAN) state. (Edge Switch 2/24 only.)
Type	The port type as set in the <code>config.port.type</code> command.
Speed	The port speed as set in the <code>config.port.speed</code> 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.nodes

Syntax

```
nodes portNumber
```

Purpose

This command displays the loop node list for a specified port. This command is valid only on the Edge Switch 2/24.

Parameters

This command has one parameter.

portNumber Specifies the port number.

Valid values are:

0–23 for the Edge Switch 2/24

Command Example

```
Root> show port nodes portNumber
```

Output

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

PC Addr	The Fibre Channel address of nodes attached to this port. Private devices are assigned address strings of 0000 followed by the two-digit hexadecimal Arbitrated Loop Physical Address (ALPA), instead of the 6-digit hexadecimal number presented for public devices.
Attached WWN	The WWN of nodes attached to this port, or the string NOT LOGGED IN for a private loop device.
Class	The Class value for public devices. This field is left blank for private devices.
Data Field Size	The Data Field Size value for public devices. This field is left blank for private devices.

Output Example

The Data Field Size value for public devices. This field is left blank for private devices.

FC Addr	Attached WWN	Class	Data Field Size
610A01	33:00:00:00:00:00:00:03	1	2112
610A02	33:00:00:00:00:00:00:04	1	2112
610A04	33:00:00:00:00:00:00:05	1	2112
610A08	33:00:00:00:00:00:00:02	1	2112
610A0F	33:00:00:00:00:00:00:0A	1	2112
610A10	33:00:00:00:00:00:00:10	1	2112
000017	NOT LOGGED IN		
000018	NOT LOGGED IN		
00001B	NOT LOGGED IN		

If no nodes are on the loop, a message displays saying that no loop nodes are on the port.

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: <ul style="list-style-type: none">• Segmented E_Port• Invalid Attachment• Not Installed• Online• Offline• Not Operational• No Light• Testing• Port Failure• Link Reset• Inactive

Type	<p>The operational port type.</p> <p>If the configured port type is F_Port or E_Port, this value will match the configured type.</p> <p>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.</p> <p>On the Edge Switch 2/24, if the configured port type is Fx_Port, the operational port type can include FL_Port in addition to the values noted above for F_Port. If the configured port type is Gx_Port, then the operational port type can include FL_Port in addition to the values noted above for G_Port.</p>
Attached WWN	<p>The World Wide Name of the device or Switch attached to the port, if one is attached.</p>
Beaconing	<p>The beaconing state for the port (true or false).</p>
Reason	<p>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.</p> <p>The message description for this message number is provided at the bottom of the table.</p> <p>If the operational state is Segmented E_Port, only the following messages can be generated:</p> <ul style="list-style-type: none">• 00 Segment Not Defined• 01 Incompatible Operating Parameters• 02 Duplicate Domain ID(s)• 03 Incompatible Zoning Configurations• 04 Build Fabric Protocol Error• 05 No Principal Switch• 06 No Response from Attached Switch• 07 ELP Retransmission Failure Timeout

If the operational state is *Invalid Attachment* only the following messages can be generated:

- 08 None
- 09 Unknown
- 10 ISL connection not allowed on this port
- 11 ELP rejected by the attached Switch
- 12 Incompatible Switch at other end of the ISL
- 13 External loopback adapter connected to the port
- 14 N_Port connection not allowed on this port
- 15 Non-HP switch at other end of the ISL
- 16 ISL connection not allowed on this port
- 17 ISL connection not allowed to external Fabrics
- 18 Port binding violation—unauthorized WWN
- 19 Unresponsive node connected to port
- 20 Incompatible security attributes
- 21 Fabric Binding violation
- 22 Authorization failure
- 23 Switch Binding violation

If the operational state is *Inactive* only the following messages can be generated:

- 24 Inactive – RC 0
- 25 No Serial Number
- 26 Feature Not Enabled

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	Off	
1	Online	gPort	10:00:80:00:11:22:33:45	On	
2	No Light	fPort	10:00:80:00:11:22:33:55	On	
3	Offline	ePort	10:00:80:00:11:22:33:00	Off	
4	Online	gPort	10:00:80:00:11:22:33:57	Off	
5	Port Failure	fPort	10:00:80:00:11:22:33:46	Off	
6	Link Reset	gPort	10:00:80:00:11:22:33:63	Off	
7	Segmented E_Port	ePort	10:00:80:00:11:22:33:47	Off	02
8	Online	ePort	10:00:80:00:11:22:33:88	Off	
9	Offline	fPort	10:00:80:00:11:22:33:49	Off	
10	Inactive	ePort	10:00:80:00:11:22:33:50	Off	26
11	Online	fPort	10:00:80:00:11:22:33:53	Off	
12	No Light	fPort	10:00:80:00:11:22:33:56	Off	
13	Online	fPort	10:00:80:00:11:22:33:59	Off	
14	Invalid Attachment	fPort	10:00:80:00:11:22:33:64	Off	15
15	Online	fPort	10:00:80:00:11:22:33:66	Off	

02: Duplicate Domain ID(s)

03: Switch Speed Conflict

07: ISL connection not allowed on this port

show.port.technology

Syntax

```
technology
```

Purpose

This command shows the 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.fabricBinding

Syntax

```
fabricBinding
```

Purpose

This command displays the fabric binding configuration saved on the fabric. The command performs the same function as `config.security.fabricBinding.showActive` command.

Parameters

This command has no parameters.

Command Example

```
Root> show security fabricBinding
```

Output

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

Fabric Binding State The active fabric binding state: Inactive or Active Restricting

Fabric Membership List The active fabric membership list.

Output Example

The output from the `show.security.fabricBinding` command displays as follows:

```
Fabric Binding State:    Active Restricting
Domain 1    (00:11:22:33:44:55:66:77)
Domain 2    (88:99:AA:BB:CC:DD:EE:FF)
Domain 14    (11:55:35:45:24:78:98:FA)
```

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 or 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.security.switchBinding

Syntax

```
switchBinding
```

Purpose

This command displays the Switch binding configuration.

Parameters

This command has no parameters.

Command Example

```
Root> show security switchBinding
```

Output

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

```
Switch Binding State    Disabled, Enabled and Restricting  
                        F_Ports,  
                        Enabled and Restricting E_Ports, or  
                        Enabled and Restricting All Ports  
Switch Membership List The active Switch membership list.
```

Output Example

The output from the `show.security.switchBinding` command displays as follows:

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: <ul style="list-style-type: none">• online• offline
BB Credit	The BB credit as set in the <code>config.switch.bbCredit</code> command.
R_A_TOV	The R_A_TOV as set in the <code>config.switch.raTov</code> command.
E_D_TOV	The E_D_TOV as set in the <code>config.switch.edTov</code> command.
Preferred Domain Id	The domain ID as set in the <code>config.switch.domainId</code> command.
Switch Priority	The Switch priority as set in the <code>config.switch.priority</code> command.
Speed	The Switch speed as set in the <code>config.switch.speed</code> command. (This does not apply to the Edge Switch 2/24.)

Rerouting Delay	The rerouting delay as set in the <code>config.switch.rerouteDelay</code> 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 <code>config.switch.interopMode</code> 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.
Insistent Domain Id	Configured Insistent domain ID state as set in the <code>config.switch.insistDomainId</code> command.
Domain RSCN	Configured Domain RSCN state as set in the <code>config.switch.domainRSCN</code> command.

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
  Insistent Domain Id: Enabled
  Domain RSCN:         Enabled
```

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 <code>config.system.name</code> command.
Description	The system description as set in the <code>config.system.description</code> command.
Contact	The system contact as set in the <code>config.system.contact</code> command.
Location	The system description as set in the <code>config.system.description</code> command.
Date/Time	The system date and time as set in the <code>config.system.date</code> 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 <code>maint . system . beacon</code> 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	The enabled status, name, and member zones of
ZoneSet	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
```

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.

Table A-1: CLI Error Messages

Message	Description	Action
Error 05: Busy	The Switch is busy or processing another request.	After a few second, reissue the request.
Error 08: Invalid Switch Name	The value entered for the Switch name is invalid.	The name for a Director or Edge Switch 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	The value entered for the Switch description is invalid.	The description for the Director or Edge Switch can contain 0–255 characters. Enter a description with 0–255 characters. If spaces are used, enclose the description in quotation marks.

Message	Description	Action
Error 10: Invalid Switch Location	The value entered for the Switch location is invalid.	The location for the Director or Edge 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	The value entered for the Switch contact is invalid.	The contact for the Director or Edge 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	The value entered for the port number is invalid.	Enter a port number within the range supported by the Director or Edge Switch. Valid values are: <ul style="list-style-type: none">• 0–15 for the Edge Switch 2/16• 0-23 for the Edge Switch 2/24• 0–31 for the Edge Switch 2/32• 0–63 for the Director 2/64• 0-127 and 132-144 for the Director 2/140

Message	Description	Action
Error 14: Invalid Port Name	The value entered for the port name is invalid.	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	The value entered for the buffer-to-buffer credit is invalid.	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	The value entered for the resource allocation time-out value is invalid.	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. Check to be sure that all these conditions are met and re-submit.
Error 17: Invalid E_D_TOV	The value entered for the error detect time-out value is invalid.	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. Check to be sure that all these conditions are met and re-submit.

Message	Description	Action
Error 18: Invalid TOV	The E_D_TOV and R_A_TOV values are not compatible.	Enter a valid E_D_TOV/R_A_TOV combination. The E_D_TOV must be smaller than the R_A_TOV.
Error 20: Invalid Preferred Domain ID	The value entered for the preferred domain ID for the Director or Edge Switch is invalid.	The preferred domain ID must be an integer in the range 1–31. Enter an appropriate value and resubmit.
Error 21: Invalid Switch Priority	The value entered for the Switch priority is invalid.	The Switch priority entered for the Director or Edge Switch must be <code>principal</code> , <code>default</code> , or <code>neverprincipal</code> . (Refer to the description of the command in config.switch.priority on page 2-51 .) Enter <code>principal</code> , <code>default</code> , or <code>neverprincipal</code> .
Error 29: Invalid Gateway Address	The value entered for the gateway address is invalid.	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	The value entered for the IP address of the Director or Edge Switch is invalid.	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.

Message	Description	Action
Error 31: Invalid Subnet Mask	The value entered for the new subnet mask for the Ethernet interface is invalid.	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	The value entered for the SNMP community name is invalid.	The SNMP community name is the name of the community specified in the <code>config.snmp.addCommunity</code> 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 <code>writeAuthorization</code> values must match. Enter an SNMP community name that meets all of the requirements.
Error 33: Invalid SNMP Trap Address	The value entered for the SNMP trap address is invalid.	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.

Message	Description	Action
Error 34: Duplicate Community Names Require Identical Write Authorization	The two or more entered community names are identical, but their corresponding write authorizations are not identical.	Enter different values for the community names, or enter identical write authorizations for the duplicate community names.
Error 37: Invalid Month	The value of the month entered for the new system date is invalid.	The format of the <i>date</i> 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	The value of the day entered for the new system date is invalid.	The format of the <i>date</i> 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	The value of the year entered for the new system date is invalid.	The format of the <i>date</i> 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	The value of the hour entered for the new system time is invalid.	The format of the <i>time</i> 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.

Message	Description	Action
Error 41: Invalid Minute	The value of the minute entered for the new system time is invalid.	The format of the <i>time</i> 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	The value of the second entered for the new system time is invalid.	The format of the <i>time</i> 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	A new SNMP community cannot be defined before removing an existing community from the list.	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	The entered command requires that the Director or Edge Switch be set offline.	Set the Director or Edge Switch offline before reentering the command.
Error 55: Invalid Zone Name	The value entered for the zone name is invalid.	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.

Message	Description	Action
Error 57: Duplicate Zone	Two or more zone names in the zone set are identical.	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	Two or more zone names in the zone set are identical.	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	The entered command tried to add more zone members than the zone can hold.	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	The specified zone member is neither a World Wide Name (WWN) nor a domain-port pair.	The zone member type must be either a World Wide Name (WWN) or a domain-port pair. Refer to config.zoning.addWwn Mem on page 2-73 or config.zoning.addPortMem on page 2-74 for specific requirements. Enter either a WWN or domain-port pair that meets the requirements.

Message	Description	Action
Error 62: Invalid Zone Set Name	The value entered for the zone set name is invalid.	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	Two or more port names are identical.	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	The specified FRU does not exist on this product.	Refer to the product service manual for product-specific FRU information.
Error 71: FRU Not Installed	The specified FRU is not installed.	Refer to the product service manual for product-specific FRU information and procedures.
Error 72: No Backup FRU	The FRU cannot be swapped because a backup FRU is not installed.	Refer to the product service manual for product-specific FRU information and procedures. Insert a backup FRU, and reenter the command.

Message	Description	Action
Error 73: Port Not Installed	The specified port is not installed on the product.	Refer to the product service manual for information about installing a port optic.
Error 74: Invalid Number of Zones	The specified zone set contains less than one zone or more than the maximum number of zones allowed for this product.	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	The specified zone set exceeds the NV-RAM limitations of the Director or Edge Switch.	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	The specified zone contains more than the maximum number of zone members allowed per zone set for this product.	Reduce the number of members in the zone before reentering the command.
Error 77: Not Allowed While Port Is Failed	The specified port is in a failed or inactive state or requires service.	Refer to the product service manual for the appropriate action.
Error 78: System Error Light On	This product cannot beacon because the system error light is on.	Refer to the product service manual for the appropriate procedure. Clear the system error light before enabling beaconing.
Error 79: FRU Failed	The specified FRU has failed.	Refer to the product service manual for the appropriate procedure.

Message	Description	Action
Error 81: Default Zone Enabled	The request cannot be completed because the default zone is enabled.	Disable the default zone before reentering the command.
Error 82: Invalid Interop Mode	The value entered for the interoperability mode is not valid.	The interoperability mode for the Director or Edge 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	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	Configure the interoperability mode as Homogenous Fabric in the previous series of commands.
Error 88: Invalid Feature Key Length	The value of the specified feature key is longer than the maximum length allowed.	Refer to config.features.installKey on page 2-5 for requirements, and reenter the feature key. If problems persist, contact your sales representative.

Message	Description	Action
Error 89: Not Allowed in S/390 Mode Without the SANtegrity™ Feature	This procedure is not allowed in S/390 mode.	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 <i>HAFM</i> application to change the product operating mode, and then reenter the command.
Error 90: Invalid Port Type	The configured port type is invalid.	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	Ports cannot be configured as E_Ports in S/390 mode.	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	The port must be blocked to complete this request.	Block the port, and then resubmit the command.
Error 93: Not Allowed While FICON MS Is Installed	This request cannot be completed because FICON Management Server is installed.	This action is not supported. No action necessary.
Error 94: Invalid Feature Combination	The requested features cannot be installed at the same time on one Director or Edge Switch.	Contact your sales representative.
Error 99: Preferred Domain ID Cannot Be Zero	This Switch cannot be configured to have a preferred domain ID equal to zero (0).	Enter an integer in the range 1–31 for the preferred domain ID.

Message	Description	Action
Error 101: Command Not Supported on This Product	This product does not support the specified command.	Information only message: this operation is not supported.
Error 102: Switch Not Operational	The request cannot be completed because the Switch is not operational.	Refer to the product service manual, and consult your service representative.
Error 115: Invalid Switch Speed	The request cannot be completed because the Switch is not capable of operating at the configured speed.	Refer to the product service manual to determine the speed capabilities of the product.
Error 116: Switch Not Capable of 2 Gbps	The request cannot be completed because the Switch is not capable of operating at 2.125 gigabits per second (Gbps).	Refer to the product service manual to determine the speed capabilities of the product.
Error 117: Ports Cannot be Set at Higher Data Rate than Switch Speed	The request cannot be completed because the requested port speed is faster than the configured Switch speed.	The Switch speed should first be configured to accommodate changes in the configured port speed. The ports cannot operate at a faster rate than the Switch itself. Update the Switch speed and resubmit the request. For more information about setting speeds, see config.switch.speed on page 2-55 and config.port.speed on page 2-17 .
Error 118: Invalid Port Speed	This request cannot be completed because the requested port speed is not recognized for this product.	Port speeds may be set to 1 Gbps or 2 Gbps. Update the port speed and resubmit the request.

Message	Description	Action
Error 119: Switch Speed Not 2 Gb/sec	This request cannot be completed because the Switch speed has not been set to 2 Gbps.	The Switch speed must be set to 2 Gbps in order to accommodate a port speed of 2 Gbps. Update the Switch speed and resubmit the request.
Error 134: Invalid Membership List	Generic message to indicate a problem in either the Switch binding or fabric binding membership list	Be sure that the membership list submitted does not isolate a Switch already in the fabric. If this is not the case, the user needs to be aware of all fabric security rules and make sure that the list submitted adheres appropriately.
Error 135: Invalid Number of Fabric Membership List Entries	The number of fabric members submitted exceeds the maximum allowable entries of 31.	The number of entries in the fabric membership list is limited to the total number of domain ID's available to the fabric. Make sure that the list (including the managed Switch) contains no more than 31 entries.
Error 136: Invalid Number of Switch Membership List Entries	The number of Switch members submitted exceeds the maximum allowable entries of 256.	The number of entries in the Switch membership list is limited to 256. Make sure that the list (including the managed Switch) contains no more than 256 entries.
Error 137: Invalid Fabric Binding State	The fabric binding state submitted is not recognized by the CLI.	The fabric binding state must be set to either inactive or restrict. For more information, see config.security.fabricBinding on page 2-22 .

Message	Description	Action
Error 138: Invalid Switch Binding State	The Switch binding state submitted is not recognized by the CLI.	The Switch binding state must be set to one of the following: <code>disable</code> , <code>erestrict</code> , <code>frestrict</code> , or <code>allrestrict</code> . For more information, see config.security.switchBinding on page 2-32.
Error 139: Insistent Domain ID's Must Be Enabled When Fabric Binding Active	The user attempted to disable insistent domain ID's while fabric binding was active.	Insistent domain ID's must remain enabled while fabric binding is active. If fabric binding is set to <code>inactive</code> , the insistent domain ID state may be changed. It should be noted, however, that this can be disruptive to the fabric.
Error 140: Invalid Insistent Domain ID State	The request cannot be completed because an invalid insistent domain ID state has been submitted.	The insistent domain ID state must be set to either <code>enable</code> or <code>disable</code> . For more information, see config.switch.insistDomainId on page 2-47.
Error 141: Invalid Enterprise Fabric Mode	The request cannot be completed because an invalid Enterprise Fabric mode has been submitted.	The Enterprise Fabric mode must be set to either <code>activate</code> or <code>deactivate</code> . For more information, see config.features.enterpriseFabMode on page 2-3.
Error 142: Invalid Domain RSCN State	The request cannot be completed because an invalid domain RSCN state has been submitted.	The domain RSCN state must be set to either <code>enable</code> or <code>disable</code> . For more information, see config.switch.domainRSCN on page 2-46.

Message	Description	Action
Error 143: Domain RSCNs Must Be Enabled When Enterprise Fabric Mode Active	The user attempted to disable domain RSCN's while Enterprise Fabric mode was active.	Domain RSCN's must remain enabled while the Enterprise Fabric mode is active. If Enterprise Fabric mode is set to inactive, the domain RSCN state may be changed. It should be noted, however, that this can be disruptive to the fabric.
Error 144: The SANtegrity Feature Has Not Been Installed	The user attempted to activate a change to the fabric security configuration without first installing the SANtegrity feature key.	If this key has not been installed, contact your sales representative.
Error 146: Fabric Binding May Not Be Deactivated While Enterprise Fabric Mode Active	The user attempted to deactivate fabric binding while Enterprise Fabric mode was active.	Fabric binding must be active while operating in Enterprise Fabric mode. The fabric binding state may be changed if Enterprise Fabric mode is deactivated. It should be noted, however, that this can be disruptive to the fabric.
Error 148: Not Allowed While Switch Offline	The Switch must be online to complete this request.	Change the state of the Switch to <code>ONLINE</code> and re-submit the request.
Error 149: Not Allowed While Enterprise Fabric Mode Enabled and Switch Active	The request cannot be completed while the Switch is online and Enterprise Fabric mode is Active.	This operation will be valid if the Switch state is set to <code>offline</code> and Enterprise Fabric mode to <code>inactive</code> . It should be noted, however, that this can be disruptive to the fabric.

Message	Description	Action
Error 151: Invalid Open Systems Management Server State	The request cannot be completed because the OSMS state submitted is invalid.	The OSMS state may be set to either <code>enable</code> or <code>disable</code> . For more information, see config.features.OpenSysMS on page 2-6.
Error 152: Invalid FICON Management Server State	The request cannot be completed because the FICON MS state submitted is invalid.	The FICON MS state may be set to either <code>enable</code> or <code>disable</code> . For more information, see config.features.ficonms on page 2-4.
Error 153: Feature Key Not Installed	The request cannot be completed because the required feature key has not been installed to the firmware.	Contact your sales representative.
Error 154: Invalid Membership List WWN	The request cannot be completed because the WWN does not exist in the Switch binding membership list.	Make sure that the WWN deleted matches the WWN in the Switch membership list. Make appropriate changes and re-submit the request.

Message	Description	Action
Error 155: Cannot Remove Active Member From List	This member cannot be removed from the fabric security list because it is currently logged in.	Fabric security rules prohibit any device or Switch from being isolated from the fabric via a membership list change. If it is truly the intention of the user to remove the device in question from the membership list, then there are several approaches to take. This request may be completed most non-disruptively by blocking the port (or physically removing the device from the managed Switch) to which this device is attached and resubmitting the request.
Error 156: Cannot Disable Fabric Binding while Switch is Online	The Switch must be offline before Fabric Binding can be deactivated.	Deactivating fabric binding is disruptive to Fabric operations. Set the Switch offline before deactivating this feature.
Error 201: Change Authorization Request Failed	The Switch did not accept the request to make a change to NVRAM.	Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.
Error 202: Invalid Change Authorization ID	The Switch will not accept a change request from this particular client.	Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.

Message	Description	Action
Error 203: Another Client Has Change Authorization	Another user is currently making changes to this Switch.	Check that all the parameters are correct, and reenter the command.
Error 207: Change Request Failed	The Switch did not accept the request.	Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.
Error 208: Change Request Timed Out	The authorization time allowed to make NVRAM changes has expired.	Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.
Error 209: Change Request Aborted	The Switch did not accept the request.	Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.
Error 210: Busy Processing Another Request	A different Switch in the fabric was busy processing another request and could not complete the command.	Check that all the parameters are correct, and reenter the command. If problems persist, contact your service representative.
Error 211: Duplicate Zone	The entered command tried to add a zone name that already exists in the local zone set.	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.

Message	Description	Action
Error 212: Duplicate Zone Member	The entered command tried to add a member that already exists in the zone.	No action required
Error 213: Number of Zones Is Zero	The <code>config.zoning.activateZoneSet</code> command tried to activate a zone set contained in the work area to the fabric; however, the zone set is empty.	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 <code>config.zoning.activateZoneSet</code> command to activate the zone set in the work area to the fabric.
Error 214: A Zone Contains Zero Members	The <code>config.zoning.activateZoneSet</code> 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.	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 <code>config.zoning.activateZoneSet</code> command to activate the zone set in the work area to the fabric.
Error 215: Zone Set Size Exceeded	The size of the local work-area zone set has outgrown the size supported by the CLI.	Reduce the size of the zone set to meet CLI requirements by doing one or more of the following:

Message	Description	Action
Error 218: Invalid Port Number	The value specified for the port number is invalid.	Enter a port number within the range supported by the Director or Edge Switch. Valid values are: <ul style="list-style-type: none"> • 0–15 for the Edge Switch 2/16 • 0–23 for the Edge Switch 2/24 • 0–31 for the Edge Switch 2/32 • 0–63 for the Director 2/64 • 0–127 and 132–144 for the Director 2/140
Error 219: Invalid Port Type	The value specified for the port type is invalid.	A port may be configured as an E_Port, a G_Port, or an F_Port. Make sure the port is configured appropriately and resubmit the command. The Fx_port and Gx_port types are also supported on the Edge Switch 2/24.
Error 222: Invalid SNMP Community Index	The value specified for the SNMP community index is invalid.	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	The Switch did not accept the request.	Contact your service representative.

Message	Description	Action
Error 224: Invalid Argument	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.	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	The CLI received one or more non-USASCII characters.	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	One or more parameters of the specified command are invalid.	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	The value specified for the SNMP community name is invalid.	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.

Message	Description	Action
Error 228: Invalid Write Authorization Argument	The <i>writeAuthorization</i> parameter does not contain a valid value.	Parameters must be typed exactly to specification to be recognized correctly by the CLI. For more information, see config.snmp.addCommunity on page 2-39.
Error 229: Invalid UDP Port Number	The <i>udpPortNum</i> parameter does not contain a valid value.	Parameters must be typed exactly to specification to be recognized correctly by the CLI. For more information, see config.switch.insistDomainId on page 2-47.
Error 230: Invalid WWN	The <i>wwn</i> parameter does not contain a valid value.	For the appropriate parameters, see the section of the manual that corresponds to the attempted command. Parameters must be typed exactly to specification to be recognized correctly by the CLI.
Error 231: Invalid Port Number	The value specified for the <i>portNumber</i> parameter is invalid.	Refer to Chapter 2 for information about the commands with the <i>portNumber</i> parameter. Specify a valid port number value, and resubmit the command.

Message	Description	Action
Error 232: Invalid Domain ID	The value specified for the <i>domainId</i> parameter is invalid. For example, the <i>domainId</i> parameter of the <code>config.switch.prefDomainId</code> command requires an integer in the range 1–31.	Refer to Chapter 2 for information about the commands with the <i>domainId</i> parameter. Specify a valid domain ID value, and resubmit the command.
Error 233: Invalid Member	The value specified for the <i>zoneName</i> parameter (the name of the zone member) is invalid.	Refer to Chapter 2 for information about the commands with the <i>zoneName</i> parameter. Specify a valid name for the zone member, and resubmit the command.
Error 234: Invalid Command	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.	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 1–7 . Ensure that the command has been entered at the right place in the CLI command tree, and then resubmit the command.

Message	Description	Action
Error 235: Unrecognized Command	The CLI does not recognize the submitted command and cannot perform the <code>help (?)</code> command as requested.	Refer to Using the Command Line Interface Help on page 1-14 for information about the <code>help</code> 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 1–7 . 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	The CLI does not recognize the submitted command issued.	The CLI cannot interpret the command because a unique match cannot be identified. For the appropriate syntax, see the section of the manual that corresponds to the attempted command. Enter the complete command and resubmit.
Error 237: Invalid Zoning Database	An unidentifiable problem with the zone set in the local work area occurred.	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.

Message	Description	Action
Error 238: Invalid Feature Key	The specified feature key is invalid.	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.
Error 239: Fabric binding entry not found	The user requested to remove a fabric binding entry that is not in the pending fabric membership list.	Verify that the correct entry (both WWN and Domain ID) is being requested for removal from the list and re-submit the request.
Error 240: Duplicate fabric binding member	The user requested to add an entry to the fabric binding list that is already a member of the list.	Verify that the correct entry (both WWN and Domain ID) is being requested for addition to the list and re-submit the request.
Error 241: Comma-delimited mode must be active	Comma-delimited mode must be active to execute this command.	Some commands require that comma-delimited mode be active (for example, <code>show.nameserverExt</code>). Enable comma-delimited mode and re-issue the command.

Message	Description	Action
Error 242: Open trunking threshold % value must be 0–99	An invalid threshold percentage has been entered.	The Open trunking threshold must be in the range 0–99. Make sure all values are valid and resubmit the request.
Error 243: Not allowed while S/390 Mode is Enabled	This operation is not allowed while S/390 mode is enabled.	This command is not valid for the S/390 environment.

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 multiswitch 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.

ALPA

Arbitrated Loop Physical Address.

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.

backup FRU

When an active FRU fails, an identical backup FRU takes over operation automatically (failover) to maintain Director and Fibre Channel link operation.

beaconing

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

BB_Credit

See buffer-to-buffer credit.

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 Edge Switch; or communicating with other devices attached to the Director or Edge 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.

channel

A point-to-point link that transports data from one point to the other.

class of Fibre Channel service

Defines the level of connection dedication, acknowledgment, and other characteristics of a connection.

Class F Fibre Channel service

Used by Switches to communicate across interswitch links (ISLs) to configure, control, and coordinate a multiswitch 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.

connector

See optical fiber connector.

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

Pertaining to an attribute, value, or option that is assumed when none is explicitly specified.

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 Edge S

dialog box

A window containing informational messages or data fields to be modified or filled in with desired options.

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 multiswitch 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 Edge 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 message

Indication that an error has been detected. See also information message; warning message.

error detect time-out value (E_D_TOV)

User-specified value that defines the time a Director or Edge 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 Edge Switches.

event code

Error code that provides the operator with information concerning events that indicate degraded operation or failure of a Director or Edge Switch.

event log

Record of significant events that have occurred at the Director or Edge 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 multiswitch 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 Edge 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.

FAN

Fabric address notification.

FCP

A standard Fibre Channel protocol used to run SCSI over Fibre Channel.

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.

Fibre Channel Address

There are two types of Fibre Channel addresses:

- An address for a public device, comprised of the domain ID, port address, and its AL_PA
- An address for a private device, comprised of 0000 followed by its AL_PA.

In both cases, the Fibre Channel address is represented as a six-digit hexadecimal string.

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 Edge Switch.

F_Port

See fabric port.

FL_Port

Edge Switch 2/24 supports the operation of Arbitrated Loop.

FX_Port

A port configuration allowing a port to transition operationally to either an F_Port or an FL_Port. Only the Edge Switch 2/24 supports the configuration of this port type.

FRU

See field-replaceable unit.

G_Port

See generic port.

gateway

A multi-homed host used to route network traffic from one network to another, and to pass network traffic from one protocol to another.

gateway address

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

Gbps

Gigabits per second.

generic port (G_Port)

Physical interface on a Director or Edge 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.

Gx_Port

A port configuration allowing a port to transition operationally to FL_Port as well as to the port operational states described for a G_Port. Only the Edge Switch 2/24 supports the configuration of this port type.

High Availability Fabric Manager (HAFM)

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 Edge Switch that runs the *HAFM* and *Product Manager* applications.

hardware log

Record of FRU insertions and removals for a Director or Edge 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.

information message

A message telling a user that a function is performing normally or has completed normally. See also error message; warning message.

initial machine load (IML)

Hardware reset for a Director or Edge Switch, initiated by pushing the button on a Director CTP card or Edge 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.

interface

Hardware, software, or both, linking systems, programs, or devices.

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 Edge 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.

LIPS

Loop Initialization Primitives.

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 Edge 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.

multiswitch fabric

Fibre Channel fabric created by linking more than one Director or Edge 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 Edge 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.

operating state (Director)

The operating states are as follows:

Online - when the Director is set online, an attached device can log in to the Director if the port is not blocked. Attached devices can communicate with each other if they are configured in the same zone.

Offline - when the Director is set offline, all ports are set offline. The Director transmits the offline sequence (OLS) to attached devices, and the devices cannot log in to the Director.

operating state (port)

Valid states are:

- Online, offline, or testing.
- Beaconing.
- Invalid attachment.
- Link incident or link reset.
- No light, not operational, or port failure.
- Segmented E_Port.

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.

optical fiber connector

Hardware component that transfers optical power between two optical fibers or bundles and is designed to be repeatedly connected and disconnected.

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.

path

In a network, any route between any two ports.

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 Edge 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 Edge Switch that allocates domain IDs to itself and to all other Switch 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 that implements the management user interface for a specified Director or Edge Switch. 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 multiswitch fabric due to an incompatibility between the fabrics that it joins. *See also* expansion port.

SEL

System error light.

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.

Switch priority

Value configured into each Switch in a fabric that determines its relative likelihood of becoming the fabric's principal Switch.

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, *contrast with* jumper cable.

unblocked port

Devices attached to an unblocked port can login to the Director or Edge 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.

warning message

Indication that a possible error has been detected. *See also* error message; information message.

World Wide Name (WWN)

Eight-byte address that uniquely identifies a Switch, or a node (end device) on global networks.

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 Edge Switch to which it is attached or by its World Wide Name. In multiswitch 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 Edge Switch, may be configured into one or more zones. *See also zone.*

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