

IBM TotalStorage Storage Switch



# 2006 Model L10 CLI Reference Guide

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IBM TotalStorage Storage Switch



# 2006 Model L10 CLI Reference Guide

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## About this document

This guide describes how to configure and manage an IBM TotalStorage® Storage Switch 2006 Model L10 using the Command Line Interface (CLI).

Throughout the rest of this document, the IBM TotalStorage Storage Switch 2006 Model L10 is referred to as the Model L10, the L10, or simply the switch.

The sections that follow provide information about:

- “Model L10 library”
- “Web sites”
- “Getting software updates”
- “Getting help”
- “How to send your comments”

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## Model L10 library

The following documents contain information related to this product:

- *IBM TotalStorage Storage Switch 2006 Model L10 User's Guide*, GC26-7651-00
- *IBM TotalStorage Storage Switch 2006 Model L10 CLI Reference Guide*, GC26-7652-00 (this document)
- *IBM TotalStorage Storage Switch 2006 Model L10 Quick Reference Card*, GC26-7653-00
- *IBM TotalStorage Storage Switch 2006 Model L10 Statement of Limited Warranty*, GC26-7657-00
- *IBM Safety Notices*, SD21-0030-05

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## Web sites

You can find additional information related to the software for this and other switches at the following Web site:

<http://www.ibm.com/servers/storage/support/san>

To get specific details about models and firmware that the switch supports, see the following Web site:

<http://www.storage.ibm.com/ibmsan/>

For detailed information about the Fibre Channel standards, see the Fibre Channel Industry Association (FCIA) Web site at:

[www.fibrechannel.org/](http://www.fibrechannel.org/)

For a directory of worldwide contact information, including technical support, see the following Web site:

[www.ibm.com/contact/](http://www.ibm.com/contact/)

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## Getting software updates

Contact IBM for software updates and maintenance releases.

Select the SAN support link at the following Web site:

<http://www.storage.ibm.com/ibmsan/index.html>

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## Getting help

Before contacting technical support, check for solutions in this guide or check with the network administrator.

### Online

Contact technical support at the following Web site:

<http://www.ibm.com/servers/storage/support/san/index.html>

### Telephone

Within the United States, call 1-800-IBM-SERV (1-800-426-7378).

Outside the United States, go to the following Web site to find the appropriate service number:

<http://www.ibm.com/planetwide/>

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# Chapter 1. Introduction

This guide describes how to configure and manage an IBM TotalStorage Storage Switch 2006 Model L10 using the Command Line Interface (CLI). The CLI provides a command-based interface that enables you to configure and display switch settings.

In addition to the CLI, the Web Manager interface provides an intuitive graphical user interface that enables you to quickly check switch status or configure switch settings in a visual environment. For information on how to use Web Manager interface, see the *User's Guide*.

---

## Getting started

The CLI enables you to monitor and change system and port configurations, configure zoning, load balancing, trunking, and event reporting parameters, and download and install firmware.

## Connecting through a serial interface

Before using the CLI, ensure the switch's Ethernet network parameter settings are correct for the network configuration. The switch ships with the following default IP settings:

- IP Address: 192.168.1.129
- Netmask: 255.255.255.0
- Gateway: 192.168.1.1

If these settings need to be adjusted to open the CLI, connect to the switch through the serial interface using the instructions below.

Once the proper network configuration settings are entered, the switch can be managed over a network interface using a terminal emulation program, such as HyperTerminal®. The switch may also be accessed through the serial interface to manage the switch from a local computer.

To connect through a serial interface:

1. Attach one end of the included RS-232 null modem cable to the computer's DB-9 serial port, and attach the other end to the switch's DB-9 serial port.
2. Open a terminal session through a serial terminal emulation program (such as HyperTerminal®) with the appropriate serial port (for example, COM1) and the following serial port parameters:
  - Bits per second: 19200
  - Data bits: 8
  - Parity: None
  - Stop bits: 1
  - Flow control: None
3. If using HyperTerminal, press ENTER to receive a prompt.

4. If using the `tip` command on a UNIX workstation, do the following:
  - a. View the `/etc/remote` file and create an alias similar to Hardware but with the serial port parameters above. (Suggested name: Switch)
  - b. Use the `tip` command to establish a connection through the created alias, for example `tip switch`.

## Logging in and out

The CLI does not require login if only viewing basic switch information. Anyone can monitor basic switch information by pressing `ENTER` at the password prompt. A message appears indicating that an invalid password was entered and a minimal CLI menu is displayed. From this menu, you can view basic switch settings, including switch and port information, zoning information, and load balancing information. However, for monitoring most switch information or configuring any switch or port settings, you must log in to the switch.

To log in to the CLI:

1. Type `li` and press `ENTER`. The password prompt appears.
2. Type the password at the prompt and press `ENTER`. (The default password is 'password'.)

To log out of the CLI:

Type `lo` and press `ENTER`, or exit the terminal session.

**Note:** The CLI will automatically log users out after 30 minutes of inactivity.

If logged out of the switch due to inactivity or a command prompt does not appear, press `ENTER` to get a command prompt and log in to the switch using the instructions below.

To log in to the CLI when already connected to the switch:

1. Type `li` and press `ENTER`. The password prompt appears.
2. Type the password at the prompt and press `ENTER`.

## Menu navigation

The flexibility in the CLI menus and commands facilitates quick monitoring and configuring. Users can jump several menus ahead or back, select options, and issue commands from the command prompt.

```
root Menu:
 1. config      - Go to configuration sub-menu.
 2. diag       - Go to diagnostic sub-menu.
 3. show       - Go to show sub-menu.
 4. fw         - Go to firmware download sub-menu.
 5. reset      - Hardware Reset
 6. ?         - Help
```

OK

```
root>
```

*Figure 1. CLI main menu (root)*

**Note:** Up to 10 concurrent telnet sessions may access the switch.

Once logged in to the CLI, the Root menu (main menu) is displayed. The CLI incorporates a menu-based interface featuring a list of menus and commands. Each menu offers a selection of commands in a numbered list. Commands are entered at the command prompt. The command prompt also indicates the current menu level (for example, root/config>).

To enter a CLI command:

- Type the actual command text. For example, to select the Configuration menu from the Root menu, type `config` and press ENTER.

–or–

- Type the number of the command. Using the previous example, to select the Configuration menu from the Root menu, type `1` and press ENTER.

–or–

- Type the first few letters of the command. Either two or more letters are required to make the command unique. Using the original example, to select the Configuration menu from the Root menu, type `co` and press ENTER.

From the Root menu, you can also navigate to a specific command in a sub-menu by entering the first few letters of the sub menu, a space, and then the first few letters of the command. For example, to view system information under the Show sub-menu:

Type `sh sys` and press ENTER.

To return to the previous menu, type `..` and press ENTER.

To return directly to the Root menu, type `root` and press ENTER.

To navigate from one menu to another menu, type in the complete menu command and press ENTER.

For example, type `root show sysinfo` at the command prompt while in the Firmware menu, press ENTER, and the system information menu is displayed.

To cancel a prompt or input request, press ENTER.

If an incorrect command is entered, the 'ERROR: Invalid Command' message appears. If this message appears, ensure the correct command syntax is being entered and try again.

To display help for specific command, type `? <command name or number>` and press ENTER.

## Saving configuration changes

When making changes to the switch configuration, always save the changes to ensure the switch is configured properly. Some switch configuration changes may require a reboot of the switch.

To save changes to the switch configuration at any time:

1. Type `save` at any command prompt and press ENTER. A message appears confirming the request.
2. Type `y` and press ENTER.

## Initial switch setup

After logging in to the CLI for the first time, perform the following switch configuration tasks:

- Verify the switch's network settings.
- Change the switch's password.

**Note:** Until the default switch password is changed, any user with knowledge of the default password can make changes.

- Verify the switch's date and time settings.
- Reset the switch to enable the changes to the switch's configuration.

To verify the switch's current network settings:

From the Network Configuration menu (root/config/network), type `show` and press ENTER.

The switch ships with the following default IP settings:

- IP Address: 192.168.1.129
- Netmask: 255.255.255.0
- Gateway: 192.168.1.1

To change the IP address setting:

1. From the Network Configuration menu (root/config/network), type `ip` and press ENTER.
2. Type the new IP address and press ENTER.

To change the network mask setting:

1. From the Network Configuration menu (root/config/network), type `mask` and press ENTER.
2. Type the new network mask setting and press ENTER.

To change the default gateway setting:

1. From the Network Configuration menu (root/config/network), type `gateway` and press ENTER.
2. Type the new default gateway setting and press ENTER.

Once the network settings are configured, type `save` and press ENTER. A message appears confirming the request. Type `y` and press ENTER to save the current settings.

To change the password:

1. From the Configuration menu (root/config), type `password` and press ENTER.
2. Type the current password and press ENTER.
3. Type the new password and press ENTER.

**Note:** The password must be between 6 and 25 characters in length and is case sensitive.

4. Type the new password again and press ENTER.



To view the current date and time:

From the Root menu, type `show sysinfo` and press ENTER.

To change the date and time:

1. From the System Configuration menu (`root/config/sys`), type `time` and press ENTER.
2. Type the new date and time (MM/DD/YYYY HR:MN:SC) and press ENTER.

To reset the switch:

1. From the Root menu, type `reset` and press ENTER. A message appears confirming the request to save the current configuration.
2. To save changes and reset the switch, type `y` and press ENTER.

## CLI command reference

The diagram below displays the available CLI commands and their hierarchical structure.

Table 1. CLI command reference diagram

root --> help li lo save	1. config -->	1. save				
		2. sys -->	1. speed	8. lipen	15. fault	
			2. mode	9. name	16. evclr	
			3. oserr	10. location	17. clrled	
			4. crcerr	11. contact	18. ..	
			5. blkarb	12. syslog	19. ?	
			6. clkd	13. events		
			7. time	14. sev		
			3. default			
			4. port -->	1. beacon	5. view	9. ..
				2. show	6. edit	10. ?
			3. types	7. del		
			4. add	8. type		
		5. password				
		6. load -->	1. show	5. delalpa	9. pu1	
			2. lbclr	6. addalpa	10. pu2	
			3. delprt	7. ialpa	11. ..	
			4. addprt	8. util	12. ?	
		7. trunk -->	1. addprt	3. showmem	5. ..	
			2. delprt	4. clr	6. ?	
		8. network -->	1. reset	4. mask	7. ?	
		2. show	5. gateway			
		3. ip	6. ..			
	9. zone -->	1. bzht	7. deact	13. hz		
		2. bzdt	8. zstate	14. bzr		
		3. addprt	9. zclr	15. alpas		
		4. delprt	10. addblk	16. ..		
		5. showmem	11. delblk	17. ?		
		6. act	12. showblks			
	10. ..					
	11. ?					
	2. diag -->	1. galpa	5. delta	9. beacon		
		2. glim	6. showpri	10. con		
		3. os	7. prtctrs	11. who		
		4. ps	8. clrctr	12. ialpa		
	3. show -->	1. events	6. sysinfo	11. glim		
		2. ptype	7. zninfo	12. sensors		
		3. portinfo	8. lbinfo	13. getcon		
		4. prtctrs	9. os	14. sync		
		5. clrctr	10. galpa	15. dump		
	4. fw -->	1. tftp	3. revert	5. reset		
		2. xmodem	4. show	6. ..		
	5. reset					
	6. ?					

## Root menu (root)

The Root menu is the CLI's main menu. This menu is the first menu displayed after entering the password and logging in to the CLI.

### Menu commands

Table 2. Root menu commands

Command	Description	Additional Information
1. config	Displays the Configuration sub-menu.	See page 9.
2. diag	Displays the Diagnostics sub-menu.	See page 49.
3. show	Displays the Show sub-menu.	See page 55.
4. fw	Displays the Firmware sub-menu.	See page 63.
5. reset	Resets the switch.	See page 7.
6. ?	Displays additional information on a command.	See page 7.

## Hardware reset (reset)

This command resets the switch.

To reset the switch:

From the Root menu, type `reset` and press ENTER.

If changes have been made to the switch configuration, a message appears asking if the current configuration should be saved.

To save changes and reset the switch, type `y` and press ENTER.

To reset the switch without saving changes, type `n` and press ENTER.

To cancel the request to reset the switch, type `c` and press ENTER.

## Help (?)

This command displays the help description for a specific command.

To display help for specific command:

Type `? <command>` and press ENTER.

Enter the command using one of the following methods:

- Type the actual command text. For example, under the Show menu, to view help for the `sysinfo` command: type `? sysinfo` and press ENTER.
- Type the number of the command. For example, under the Show menu, to view help for the `sysinfo` command: type `? 6` and press ENTER.
- Type the first few letters of the command. For example, under the Show menu, to view help for the `sysinfo` command: type `? sys` and press ENTER.



---

## Chapter 2. Configuration menu (root/config)

The Configuration menu provides menus and commands for configuring the switch, ports, One-Step Zoning, Automatic Trunking, Load Balancing, and network settings.

### Menu Commands

Table 3. Configuration menu commands

Command	Description	Additional Information
1. save	Saves the current system configuration.	See page 9.
2. sys	Displays the System Configuration sub-menu.	See page 11.
3. default	Resets the switch to the factory default settings.	See page 9.
4. port	Displays the Port Configuration sub-menu.	See page 20.
5. password	Changes the switch password.	See page 10.
6. load	Displays the Load Balancing Configuration sub-menu.	See page 33.
7. trunk	Displays the Trunking Configuration sub-menu.	See page 37.
8. network	Displays the Network Configuration sub-menu.	See page 39.
9. zone	Displays the Zone Configuration sub-menu.	See page 41.
10. ..	Returns to the previous menu.	See page 10.
11. ?	Displays additional information on a command.	See page 10.

### Saving the current system configuration (root/config/save)

Switch configuration settings (for example, zoning or port settings) can be saved to the switch's Flash memory to protect against loss of power. This command automatically resets the switch.

To save the current configuration:

1. From the Configuration menu (root/config), type `save` and press ENTER to save all of the current switch configuration settings.

A message prompt appears confirming the request.

2. Type `y` and press ENTER to proceed.

The current switch configuration is saved and the switch automatically resets.

### Setting the switch to factory defaults (root/config/default)

This command returns the switch to the factory default settings; however, the network configuration and port type settings are retained.

To restore the factory default configuration:

1. From the Configuration menu (root/config), type `default` and press ENTER.

A message prompt appears confirming the request.

2. Type `y` and press ENTER.

## Changing the password (root/config/password)

This command enables you to change the password for modifying the switch's configuration. The same password is used to access both the CLI and the Web

**Note:** Until the default switch password is changed, any user with knowledge of the default password can make changes to the switch's configuration.

To change the password:

1. From the Configuration menu (root/config), type `password` and press ENTER.  
A message prompt appears asking for the current password.
2. Type the current password and press ENTER.  
If the correct password is entered, a message prompt appears asking for the new password.
3. Type the new password and press ENTER.

**Note:** The password must be between 6 and 25 characters in length and is case sensitive.

A message prompt appears asking for the new password to be entered again.

4. Type the new password and press ENTER.  
The new password is saved and activated.

## Return to previous menu (..)

This command enables you to return to the previous menu.

To return to the previous menu:

Type `..` and press ENTER.

## Help (?)

This command displays the help description for a specific command.

To display help for specific command:

Type `? <command>` and press ENTER.

Enter the command using one of the following methods:

- Type the actual command text. For example, under the Show menu, to view help for the `sysinfo` command: type `? sysinfo` and press ENTER.
- Type the number of the command. For example, under the Show menu, to view help for the `sysinfo` command: type `? 6` and press ENTER.
- Type the first few letters of the command. For example, under the Show menu, to view help for the `sysinfo` command: type `? sys` and press ENTER.

---

## System configuration menu (root/config/sys)

The System configuration menu provides commands to configure the switch settings.

### Menu commands

Table 4. System configuration menu commands

Command	Description	Additional Information
1. speed	Configures the switch speed.	See page 11.
2. mode	Configures the switch mode.	See page 12.
3. oserr	Configures the OS Error Threshold.	See page 12.
4. crcerr	Configures the CRC Error Threshold.	See page 13.
5. blkarb	Configures the Blocking Arbitration AL_PA.	See page 13.
6. clkd	Configures the Clock Delta Threshold.	See page 14.
7. time	Configures the switch time.	See page 14.
8. lipen	Configures the Stealth Intelligent Change Manager	See page 14.
9. name	Configures the switch's name.	See page 15.
10. location	Configures the switch's location.	See page 15.
11. contact	Configures the contact information for the individual or party managing the switch.	See page 15.
12. syslog	Configure the switch for a system log server	See page 16.
13. events	Displays the event log.	See page 18.
14. sev	Configures the event log's severity filter level.	See page 18.
15. fault	Configures the event log's severity fault threshold.	See page 19.
16. evclr	Clears the event log.	See page 19.
17. clrled	Clears the Fault LED.	See page 19.
18. ..	Returns to the previous menu.	See page 10.
19. ?	Displays additional information on a command.	See page 10.

## Setting the system speed (root/config/sys/speed)

This command sets the current speed per port at which the switch is running. All ports operate at the same speed. The default setting is 2.125 Gb/s.

To change the switch speed:

Type `speed <setting>` and press ENTER.

Table 5. System speed settings

Setting	Description
1	Set switch speed to 1.0625 Gb/s.
2	Set switch speed to 2.125 Gb/s.

To view the current switch speed:

From the Root menu, type `show sysinfo` and press ENTER.

## Setting the system switching mode (root/config/sys/mode)

This command sets the switching or segmenting capability of the device, which allows increased aggregate bandwidth and decreased latency by only routing data between opened ports. The default setting is on (enabled).

Disabling the switching capability places the switch into a single shared loop (FC-AL loop mode) similar to a Fibre Channel hub. In this mode, all port policies are disabled and the ports share bandwidth.

To change the switch mode:

From the System Configuration menu (root/config/sys), type `mode <setting>` and press ENTER.

*Table 6. System switching modes*

Setting	Description
1	Set switch mode to on (enabled).
2	Set switch mode to off (disabled).

To view the current switch mode:

From the Root menu, type `show sysinfo` and press ENTER.

## Configuring the OS Error Threshold (root/config/sys/oserr)

The Ordered Set Error Threshold is the maximum number of OS errors allowed in a 10-second interval before a port is bypassed. Setting this value to '0' returns the threshold to the factory default setting. The default setting is 16777215.

To change the threshold:

1. From the System Configuration menu (root/config/sys), type `oserr` and press ENTER.

The current value appears in brackets before the command prompt.

2. Type the new value and press ENTER. The valid range is from 0 to 16777215.

To view the current OS Error Threshold:

From the Root menu, type `show sysinfo` and press ENTER.



## Configuring the CRC Error Threshold (root/config/sys/crcerr)

The cyclic redundancy check (CRC) Error Threshold is the maximum number of CRC errors allowed in a 10-second interval before a port is bypassed. Setting this value to '0' returns the threshold to the factory default setting. The default setting is 3.

To change the threshold:

1. From the System Configuration menu (root/config/sys), type `crcerr` and press ENTER.

The current value appears in brackets before the command prompt.

2. Type the new value and press ENTER. The valid range is from 0 to 255.

To view the current CRC Error Threshold:

From the Root menu, type `show sysinfo` and press ENTER.

## Setting the Blocking Arbitration AL\_PA (root/config/sys/blkarb)

When two ports start a communication session, the Blocking ARB is sent to all other ports trying to communicate with those ports until the connection is terminated. The default setting is 'FF'. If other connected devices use the 'FF' setting for a different purpose, select another Blocking ARB value (for example, 'FB'). Under normal circumstances, this setting does not need to be modified.

To change the blocking ARB value:

1. From the System Configuration menu (root/config/sys), type `blkarb` and press ENTER.

The current value appears in brackets before the command prompt.

2. Type the desired selection (1-6) and press ENTER.

*Table 7. Blocking Arbitration AL\_PA*

Setting	Description
1	xF7
2	xF8
3	xFB
4	xFD
5	xFE
6	xFF

To view the current Blocking Arbitration AL\_PA:

From the Root menu, type `show sysinfo` and press ENTER.

## Configuring the Clock Delta Threshold (root/config/sys/clkd)

The Clock Delta is the amount of variance in frequency between the reference clock and an input port. The Clock Delta Threshold sets the threshold that can be used by the Clock Delta Policy to automatically bypass a port based on the frequency difference. The default setting is 200.

To change the threshold:

1. From the System Configuration menu (root/config/sys), type `clkd` and press ENTER.  
The current value appears in brackets before the command prompt.
2. Type the new value and press ENTER.  
The valid range is from 10 to 1000 (units measured in PPM).

## Setting the system time (root/config/sys/time)

This command sets the switch's current date and time for the box. The default setting is 01/01/1970 00:00:00.

**Note:** The date and time settings must be configured any time the switch loses power or is reset, as the time settings are not retained

To change the date and time:

1. From the System Configuration menu (root/config/sys), type `time` and press ENTER.  
The current time and date appear in brackets before the command prompt.
2. Type the new date and time (MM/DD/YYYY HR:MN:SC) and press ENTER.

To view the current system time:

From the Root menu, type `show sysinfo` and press ENTER.

## Configuring the Stealth Intelligent Change Manager (root/config/sys/lipen)

This command displays the current Stealth Intelligent Change Manager setting and allows you to enable or disable the Stealth Intelligent Change Manager. The Stealth Intelligent Change Manager provides stability and control over change notification disruptions on a port basis. The default setting is enabled.

To change the Stealth Intelligent Change Manager setting:

1. From the System Configuration menu (root/config/sys), type `lipen` and press ENTER.  
The current setting appears in brackets before the command prompt.
2. Type the appropriate selection (1 or 2) and press ENTER.

*Table 8. Stealth Intelligent Change Manager settings*

Setting	Description
1	enable
2	disable

## Setting the switch name (root/config/sys/name)

This command sets the switch name. The name is limited to 79 characters and quotation marks must wrap the entire name. For example, 'Storage Switch #3'. The default setting is 'Storage Switch'.

To change the switch name:

1. From the System Configuration menu (root/config/sys), type `name` and press ENTER.  
The current name appears in brackets before the command prompt.
2. Type the new name and press ENTER.

To view the current switch name:

From the Root menu, type `show sysinfo` and press ENTER.

## Setting the switch location (root/config/sys/location)

This command sets the switch location. The location is limited to 79 characters and quotation marks must wrap the entire location. For example, 'Lab #1'. The default setting is 'None'.

To change the switch location:

1. From the System Configuration menu (root/config/sys), type `location` and press ENTER.  
The current location appears in brackets before the command prompt.
2. Type the new location and press ENTER.

To view the current switch location:

From the Root menu, type `show sysinfo` and press ENTER.

## Setting the contact information (root/config/sys/contact)

This command sets the switch contact information. Contact information may be a name, telephone number, or web site address. The contact information is limited to 79 characters and quotation marks must wrap the entire contact information. For example, 'John Smith 425-555-1212'. The default setting is 'IBM Technical Support'.

To change the switch contact information:

1. From the System Configuration menu (root/config/sys), type `contact` and press ENTER.  
The contact information appears in brackets before the command prompt.
2. Type the new contact information and press ENTER.

To view the current switch contact information:

From the Root menu, type `show sysinfo` and press ENTER.

## Configuring the switch for a system log server (root/config/sys/syslog)

This command configures the switch for a system log server that monitors switch events.

To configure the switch to communicate with a system log server:

1. From the System Configuration menu (root/config/sys), type `syslog` and press ENTER.
2. Type the appropriate selection (1 - 7) and press ENTER.
3. Enter the applicable setting and press ENTER.

*Table 9. Switch settings for a system log server*

Setting	Description
1. IP Address	The system log server's IP address. The default value is 127.0.0.1.
2. Port	The port number of the system log server. The port is usually set to 514. The default value is 514.
3. Name	The name under which to log reports on the system log server. The default value is "IBM".
4. Enable	Enables the switch to send reports to the system log server (enable=1 or disable=2). The default value is 2 (disabled).
5. Facility	<p>The reporting group to send to the system log server. The default setting is 1 [userLevelMessages].</p> <p>The standard reporting groups are:</p> <ul style="list-style-type: none"> <li>0 – kernelMessages</li> <li>1 – userLevelMessages</li> <li>2 – mailSystem</li> <li>3 – systemDaemons</li> <li>4 – securityAuthorizationMessages</li> <li>5 – messagesGeneratedInternallyBySyslogd</li> <li>6 – linePrinterSubsystem</li> <li>7 – networkNewsSubsystem</li> <li>8 – uucpSubsystem</li> <li>9 – clockDaemon</li> <li>10 – securityAuthorizationMessages</li> <li>11 – ftpDaemon</li> <li>12 – ntpSubsystem</li> <li>13 – logAudit</li> <li>14 – logAlert</li> <li>15 – clockDaemon</li> <li>16 – localUse0</li> <li>17 – localUse1</li> <li>18 – localUse2</li> <li>19 – localUse3</li> <li>20 – localUse4</li> <li>21 – localUse5</li> <li>22 – localUse6</li> <li>23 – localUse7</li> </ul>

Table 9. Switch settings for a system log server (continued)

Setting	Description
6. Severity Threshold	<p>The lowest severity level at which to send messages to the system log server. Any messages that are equal to or higher in severity than the specified severity level are sent to the system log server. For example, if the severity level for system log reporting is designated as 'alert', the switch logs messages of the 'alert' or the 'emergency' severity level only—'emergency' is the only severity level higher than 'alert'. The default setting is 6 ('info').</p> <p>The severity levels include:</p> <ul style="list-style-type: none"> <li>0 – emergency</li> <li>1 – alert</li> <li>2 – critical</li> <li>3 – error</li> <li>4 – warning</li> <li>5 – notify</li> <li>6 – info</li> <li>7 – debug</li> </ul>
7. Exit Setup	Exits the setup menu.

To exit the setup menu:

Type 7 and press ENTER.

The following table provides a list of the system log messages and their severities.

Table 10. System log server messages and severities

Message	Severity
SFP Overvoltage.	CRITICAL
Port # inserted.	INFO
Port # bypassed.	INFO
Temperature Over Max.	ALERT
Temperature OK.	INFO
Port # state change to Unknown.	INFO
Port # state change to Inserted.	INFO
Port # state change to Loopback.	INFO
Port # state change to Byp-Tx Fault.	INFO
Port # state change to Diag Transmit.	INFO
Port # state change to Byp-LIP(f8,x).	INFO
Port # state change to Byp-Timeout.	INFO
Port # state change to Byp-Redundant.	INFO
Port # state change to Byp-Rx LOS.	INFO
Port # state change to Byp-Sync LOS.	INFO
Port # state change to bypassed.	INFO

## Displaying events (root/config/sys/events)

This command displays the event log entries (up to 3000 messages) generated by the switch. For a list of the severity levels and event messages, see Appendix A. Event messages on page 67.

To view the event log:

From the System Configuration menu (root/config/sys), type `events` and press ENTER.

To continue to list event messages:

Press ENTER.

To view all remaining event log messages:

Type `a` and press ENTER.

To quit viewing the event log messages:

Press CTRL-X.

## Configuring the event log severity filter (root/config/sys/sev)

This command sets the event log's severity filter level. When set, the event log will only record events that are equal to or higher than the specified severity level. The default setting is 7.

Each event has a particular severity level ranging between 'emergency' and 'info'. Users can designate the lowest severity level at which to report an event in the event log. (For example, if the severity level for event log reporting is designated as 'alert', the switch logs messages of the 'alert' or the 'emergency' severity level only—'emergency' is the only severity level higher than 'alert'.)

To change the event log severity level:

1. From the System Configuration menu (root/config/sys), type `sev` and press ENTER.

The current severity level value appears in brackets before the command prompt.

2. Type the desired selection (1 - 7) and press ENTER.

*Table 11. Event log severity filter settings*

Setting	Description
1	emergency
2	alert
3	critical
4	error
5	warning
6	notify
7	info

## Configuring the event log severity fault threshold (root/config/sys/fault)

This command sets the threshold for when the Fault LED is triggered by an event. When set, an event that is equal to or higher than the specified fault threshold will trigger the switch's Fault LED. The default setting is 3.

Each event has a particular severity level ranging between 'emergency' and 'info'. Users can designate the lowest severity level at which to trip the switch's Fault LED.

To change the event log severity level:

1. From the System Configuration menu (root/config/sys), type `fault` and press ENTER.

The current fault threshold value appears in brackets before the command prompt.

2. Type the desired selection (1 - 7) and press ENTER.

*Table 12. Event log severity fault threshold settings*

Setting	Description
1	emergency
2	alert
3	critical
4	error
5	warning
6	notify
7	info

## Clearing the event log (root/config/sys/evclr)

This command deletes all event log messages currently recorded in the log.

To delete the current list of event log messages:

1. From the System Configuration menu (root/config/sys), type `evclr` and press ENTER.

A message prompt appears confirming the request.

2. Type `y` and press ENTER.

The event log is cleared out and a new event message appears reporting the cleared event log.

## Clearing the fault LED (root/config/sys/clrled)

This command clears the switch's fault LED.

To clear the switch's fault LED:

From the System Configuration menu (root/config/sys), type `clrled` and press ENTER.

The Fault LED turns off.

---

## Port configuration menu (root/config/port)

The Port configuration menu provides commands to configure the port settings.

### Menu commands

Table 13. Port configuration menu commands

Command	Description	Additional Information
1. beacon	Beacons a port.	See page 20.
2. show	Displays a port's configuration.	See page 21.
3. types	Displays a port's Smart Setting.	See page 24.
4. view	Displays the attributes for a Smart Setting.	See page 26.
5. add	Creates a custom Smart Setting.	See page 31.
6. edit	Edits a custom Smart Setting.	See page 31.
7. del	Deletes a custom Smart Setting.	See page 31.
8. type	Selects a Smart Setting.	See page 32.
9. ..	Returns to the previous menu.	See page 10.
10. ?	Displays additional information on a command.	See page 10.

## Beaconing ports (root/config/port/beacon)

This command flashes (beacons) a port's LEDs to indicate the port needs attention. This feature is typically used when troubleshooting port problems.

To view the current port beaconing settings:

From the Port Configuration menu (root/config/port), type `beacon` and press ENTER.

To beacon a port:

From the Port Configuration menu (root/config/port), type `beacon <port number> 1` and press ENTER.

**Note:** Multiple, consecutive ports can be specified by using a dash (-). For example, to beacon ports 3, 4, and 5, type `beacon 3-5 1`.

To stop beaconing a port:

From the Port Configuration menu (root/config/port), type `beacon <port number> 2` and press ENTER.



## Displaying port configuration information (root/config/port/show)

This command displays the port configuration and policy settings.

To view the port configuration and policy settings:

1. From the Port Configuration menu (root/config/port), type `show` and press ENTER.

A list of port configuration information appears for each port.

Table 14. Port configuration information

Field	Description
Port #	The port number.
State	The current port state: bypassed, inserted, or rxLoss.
Type	<p>The topology among switches for a port.</p> <ul style="list-style-type: none"><li>• nonCascade– the default setting. No links exist between switches.</li><li>• Tree – allows arbitration fairness to other cascaded InSpeed-based switches or ports connected to end devices. If the port is a tree port then the ARB (Arbitrate) is sent down the port and, when the ARB is received back, a connection is made between the source and destination ports. All ports are viewed as 100% FC-AL compliant.</li><li>• String0 through String3 – designates the string to which a port is assigned. Strings maintain fairness when two or more InSpeed-based storage switches are serially cascaded. When the destination port is a string and an OPN is received, an ARB is transmitted throughout the total string cascade to alert all devices to enforce fairness rules. Therefore, if two devices try to ARB at the same time, the higher Priority AL_PA will win the cascade first, the lower priority one will follow.</li></ul> <p><b>Note:</b> There may be no more than two string ports in a zone.</p>
Port Control	<p>The method for controlling a port.</p> <ul style="list-style-type: none"><li>• auto – the default setting. The switch will automatically insert a port based on policy settings. This prevents the insertion of incompatible ports, which may cause disruption.</li><li>• bypass – removes a port from the zone. Use this mode to keep a device out of an initialization cycle when troubleshooting.</li><li>• extLoopback – removes a port from the zone and routes the port's receive signal back through the port's transmitter. Use this mode to isolate a specific zone for troubleshooting or test a transceiver's circuitry and attached media from the node end.</li><li>• insert – allows ports whose transceivers cannot derive a valid clock or "K" character (ordered set) to join a zone. Use this mode cautiously – devices without valid characters may put bad data into the zone, causing the zone to go down.</li></ul>
Transmitter	Enables or disables the transceiver connected to the port.

Table 14. Port configuration information (continued)

Field	Description
LIP Ctrl	<p>Methods of change notification management.</p> <ul style="list-style-type: none"> <li>• rtxlip – no change notification management</li> <li>• rxlip – devices attached to the port can receive change notifications but will not propagate change notifications generated by that port to other ports.</li> </ul> <p><b>Note:</b> Change notifications will be reflected back out of the port if originated by devices attached to this port.</p> <ul style="list-style-type: none"> <li>• txlip – propagates change notifications generated by the port to other ports but will not allow devices attached to the port to receive change notifications from other ports.</li> <li>• nolip – blocks change notifications from being propagated from the port and change notifications from devices on other ports to devices on the port.</li> <li>• Managed – <b>Note:</b> This setting should not be used unless directed to do so by a customer service representative.</li> </ul>

2. Press ENTER again to view the policy settings assigned to each port.

The policy settings for each port appear.

Table 15. Port information

Field	Description
LIP on Insert	<p>The switch normally operates under the condition that when a device is inserted onto the network, a change notification is generated. However, this condition is not always true when connecting hubs or switches together. In some instances, it is possible to connect two zones together without the zones realizing that multiple AL_PAs exist with the same values.</p> <p>When this policy is enabled, the switch always generates a change notification to ensure the proper system updates are performed. However, when a device is removed (for example, an initiator or target), the removal does not generate a change notification and there are no system updates performed.</p>
LIP on Removal	<p>This policy is similar to the Change Notification on Insertion policy, except for the change notification being sent when a device is removed rather than inserted.</p> <p>When this policy is enabled, the switch always generates a change notification to ensure the proper system updates are performed.</p>
PTBI	<p>This policy ensures a device on a port is a valid, standards-compliant participant before allowing the device to be inserted into a zone. The device must meet all of the FC-AL requirements along with going through a complete change notification cycle. During the change notification cycle, the device becomes the Initialization Master (IM) and goes through the change notification phases. Once the change notification cycle is complete, the device can be inserted. This process ensures a bad device is not allowed into the zone.</p>

Table 15. Port information (continued)

Field	Description
LIPF8 Recovery	<p>When a port is already inserted into a zone, the port transforms F8 Failure notifications into F7 Initialization notifications. When this occurs, the port is bypassed and F7 Initialization notifications are allowed in the zone. Once the initialization is complete, the Bad Zone Recovery Policy is operational and prevents a port that continues to transmit F8 Failure notifications from inserting into the zone.</p> <p><b>Note:</b> If this policy is disabled while the Bad Zone Recovery policy is enabled, a zone that does go down will still allow the Bad Zone Recovery policy to reset the zone and allow ports to be reinserted.</p> <p>When enabled, this policy prevents devices that send F8 Failure notifications from inserting into a zone. The ability to remove devices that generate F8 Failure notifications automatically and instantaneously guarantees continual system operation.</p> <p>When disabled, this policy allows devices that send F8 Failure notifications to insert into a zone and does not consider F8 Failure notifications when determining whether to insert a device or not.</p>
SEOC	<p>Serial ID Exchange on Connect. This policy is an internal diagnostic setting and should remain disabled.</p>
Smart Insertion	<p>This policy is the default operating mode for all ports and determines what the switch looks for prior to allowing a port to insert into a zone. When the policy is enabled, an external device is sent an F7 Initialization notification by the switch until an F7 Initialization notification is received from the device. Once an F7 Initialization notification is received, the port is inserted in the zone.</p> <p>This policy takes precedence over all other policies. When this policy is disabled, no additional policies are operational, and as long as a port transmits a signal of the correct frequency and amplitude, the port will be allowed in the zone.</p>
Clear on Stall	<p>In situations where the switch is operating in switching mode, some devices may fall into an operating mode where the device has opened a target but has not released the connection to the target. When this policy is enabled, the switch can detect this condition and automatically recover when this situation arises.</p>
No Comma	<p>The switch detects the amount of time a data stream has gone without receiving a comma. The time setting is set to 100 (.001 seconds). When this policy is enabled, the switch bypasses the disruptive port when the threshold is exceeded.</p>
OS Err	<p>Ordered set (OS) errors are detected and counted for each individual port. When this policy is enabled, a port is bypassed when its OS count exceeds the threshold setting. The threshold setting is based on the number of ordered set errors identified in 10 seconds.</p> <p><b>Note:</b> The threshold can be adjusted.</p>

Table 15. Port information (continued)

Field	Description
CRC Err	<p>Cyclic Redundancy Check (CRC) errors are detected and counted for each individual port. When this policy is enabled, a port is bypassed when its CRC count exceeds the threshold setting. The threshold setting is based on the number of CRC errors identified in 10 seconds.</p> <p>User intervention is required to return the port into the zone. Recovery methods include replacing the defective component, cycling power to the device on the port, removing and reinserting the bypassed port, or cycling power to the switch.</p> <p><b>Note:</b> The threshold can be adjusted.</p>
Clk Delta	<p>The switch determines the relative frequency of the signal being received by a port to the internal switch clock. The result of this test allows the determination of how far apart in frequency the switch's clock is in relation to the clock of the received signal – the clock delta. If the clock delta exceeds a set threshold, the switch is notified and the port may be bypassed if necessary. Typically, clock drift is slow enough to allow the removal and replacement of a defective part before the defective part begins to affect system performance.</p>

To quit viewing the settings:

Press CTRL-X.

## Displaying Smart Settings (root/config/port/types)

This command displays the available Smart Settings (port types). These default Smart Settings were defined by Fibre Channel storage experts to ensure the switch is optimally configured for performance and stability.

To view the Smart Settings:

From the Port Configuration menu (root/config/port), type `types` and press ENTER.

A list of the default Smart Settings appears.

Table 16. Smart Settings

Number	Port Type
1	Initiator or Target
2	Initiator with Stealth
3	Target with Stealth
4	Fabric Connection
5	Tree Cascade
6	String Cascade--Trunk 1
7	String Cascade--Trunk 2
8	String Cascade--Trunk 3
9	String Cascade--Trunk 4
10	IBM Smart Setting

Table 16. Smart Settings (continued)

Number	Port Type
11	IBM Linux Initiator
12	IBM Linux Stealth Initiator

## Default Smart Settings

The default Smart Settings cannot be modified or deleted, but these settings can be used as templates for creating custom port types.

**Note:** Changing the port type may affect the performance or behavior of the system. Depending on the implementation, some port types are better than others. For questions regarding port type or cascade configuration, contact a customer service representative.

### Initiator or Target

This Smart Setting is the default setting for all switch ports from the factory. This setting offers no change protection and all settings are set to their default values. Initiators and targets can be connected to ports that are set to this Smart Setting.

This is the recommended Smart Setting for setups with targets and initiators connected to a single switch.

### Initiator with Stealth

This Smart Setting is used when connecting a host device to the port. When a port is set to this Smart Setting, change notifications are not sent from the initiator to other devices, but change notifications are received by the initiator.

This Smart Setting is appropriate for embedded storage controllers and external Host Bus Adaptors (HBAs) or servers with installed HBAs.

### Target with Stealth

This Smart Setting is used when connecting embedded storage devices, like JBOD enclosures, SBOD™ enclosures, tape drives, or external RAID systems (JBOD enclosures, SBOD enclosures, or tape libraries). When a port is set to this Smart Setting, change notifications are sent to other devices, but change notifications are not received by the target.

### Fabric Connection

This Smart Setting is used when connecting a port to a Fabric switch. Only one connection from the L10 storage switch to a Fabric switch is valid.

### Tree Cascade

This Smart Setting is used when connecting two or more switches together in a tree configuration. Up to four tree cascades are supported between switches.

### String Cascade

This Smart Setting is used when connecting two switches together in a string configuration. Up to four string cascades are supported between two switches.

Before selecting a cascade option, consider the following:

- Cascade ports of like number should be connected together. For example, connect port 1 of Switch A to port 1 of Switch B.
- Cascade port numbers must be lower than non-cascade port numbers (for example, Initiator or Target ports). Therefore, select cascade types before selecting these non-cascade types.
- A maximum of two switches may be connected using string cascades.

#### **IBM Smart Setting**

This Smart Setting is a custom setting defined by IBM.

#### **IBM Linux Initiator**

This Smart Setting is a custom setting defined by IBM that has the Port Test Before Insert (PTBI) policy disabled.

#### **IBM Linux Stealth Initiator**

This Smart Setting is a custom setting defined by IBM that has the Port Test Before Insert (PTBI) policy disabled, and the Stealth Intelligent Change Manager feature is enabled and set to “Only Receive Changes”.

## **Displaying Smart Setting attributes (root/config/port/view)**

This command displays the attributes for a specific Smart Setting. See “Displaying Smart Settings (root/config/port/types)” on page 24 for a list of port type numbers.

To view the Smart Setting attributes:

From the Port Configuration menu (root/config/port), type `view <port type number>` and press ENTER.

The Smart Setting attributes include.

Table 17. Smart Setting attributes

Attribute	Description
Port Type Name	The name of the port type setting. If using one of the pre-defined port types, the name will automatically appear.
Cascade Type	<p>The topology among switches for a port.</p> <ul style="list-style-type: none"> <li>• Initiator or Target Port – the default setting. For when there are no links among switches.</li> <li>• Tree – allows arbitration fairness to other cascaded InSpeed-based switches or ports connected to end devices. If the port is a tree port then the ARB (Arbitrate) is sent down the port and, when the ARB is received back, a connection is made between the source and destination ports. All ports are viewed as 100% FC-AL compliant.</li> <li>• String0 through String3 – designates the string to which a port is assigned. Strings maintain fairness when two or more InSpeed-based storage switches are serially cascaded. When the destination port is a string and an OPN is received, an ARB is transmitted throughout the total string cascade to alert all devices to enforce fairness rules. Therefore, if two devices try to ARB at the same time, the higher Priority AL_PA will win the cascade first, the lower priority one will follow.</li> </ul> <p><b>Note:</b> There may be no more than two string ports in a zone.</p>
Control	<p>The method for controlling a port.</p> <ul style="list-style-type: none"> <li>• auto – the default setting. The switch will automatically insert a port based on policy settings. This prevents the insertion of incompatible ports, which may cause disruption.</li> <li>• bypass – removes a port from a zone. Use this mode to keep a device out of an initialization cycle when troubleshooting.</li> <li>• extLoopback – removes a port from the zone and routes the port's receive signal back through the port's transmitter. Use this mode to isolate a specific zone for troubleshooting or test a transceiver's circuitry and attached media from the node.</li> <li>• insert – allows ports whose transceivers cannot derive a valid clock or "K" character (ordered set) to join the zone. Use this mode cautiously – devices without valid characters may put bad data into the zone, causing the zone to go down.</li> </ul>
Transmitter	Enables or disables the transceiver connected to the port.

Table 17. Smart Setting attributes (continued)

Attribute	Description
LIP on Insert Policy	<p>The switch normally operates under the condition that when a device is inserted onto the network, a change notification is generated. However, this condition is not always true when connecting hubs or switches together. In some instances, it is possible to connect two zones together without the zones realizing that multiple AL_PAs exist with the same values.</p> <p>When this policy is enabled, the switch always generates a change notification to ensure the proper system updates are performed. However, when a device is removed (for example, an initiator or target), the removal does not generate a change notification and there are no system updates performed.</p>
LIP on Removal Policy	<p>This policy is similar to the Change Notification on Insertion policy, except for the change notification being sent when a device is removed rather than inserted.</p> <p>When this policy is enabled, the switch always generates a change notification to ensure the proper system updates are performed.</p>
Port Test Before Insert Policy	<p>This policy ensures a device on a port is a valid, standards-compliant participant before allowing the device to be inserted into a zone. The device must meet all of the FC-AL requirements along with going through a complete change notification cycle. During the change notification cycle, the device becomes the Initialization Master (IM) and goes through the change notification phases. Once the change notification cycle is complete, the device can be inserted. This process ensures a bad device is not allowed into the zone.</p>



Table 17. Smart Setting attributes (continued)

Attribute	Description
LIP (F8) Recovery Policy	<p>When a port is already inserted into a zone, the port transforms F8 Failure notifications into F7 Initialization notifications. When this occurs, the port is bypassed and F7 Initialization notifications are allowed in the zone. Once the initialization is complete, the Bad Zone Recovery Policy is operational and prevents a port that continues to transmit F8 Failure notifications from inserting into the zone.</p> <p><b>Note:</b> If this policy is disabled while the Bad Zone Recovery policy is enabled, a zone that does go down will still allow the Bad Zone Recovery policy to reset the zone and allow ports to be reinserted.</p> <p>When enabled, this policy prevents devices that send F8 Failure notifications from inserting into a zone. The ability to remove devices that generate F8 Failure notifications automatically and instantaneously guarantees continual system operation.</p> <p>When disabled, this policy allows devices that send F8 Failure notifications to insert into a zone and does not consider F8 Failure notifications when determining whether to insert a device or not.</p>
SEOC Policy	Serial ID Exchange on Connect. This policy is an internal diagnostic setting and should remain disabled.
Smart Insertion Policy	<p>This policy is the default operating mode for all ports and determines what the switch looks for prior to allowing a port to insert into a zone. When the policy is enabled, an external device is sent an F7 Initialization notification by the switch until an F7 Initialization notification is received from the device. Once an F7 Initialization notification is received, the port is inserted in the zone.</p> <p>This policy takes precedence over all other policies. When this policy is disabled, no additional policies are operational, and as long as a port transmits a signal of the correct frequency and amplitude, the port will be allowed in the zone.</p>
Clear on Stall Policy	In situations where the switch is operating in switching mode, some devices may fall into an operating mode where the device has opened a target but has not released the connection to the target. When this policy is enabled, the switch can detect this condition and automatically recover when this situation arises.
Bypass on No Comma Policy	The switch detects the amount of time a data stream has gone without receiving a comma. The time setting is set to 100 (.001 seconds). When this policy is enabled, the switch bypasses the disruptive port when the threshold is exceeded.

Table 17. Smart Setting attributes (continued)

Attribute	Description
LIP Control	<p>Methods of change notification management.</p> <ul style="list-style-type: none"> <li>• rtxlip – no change notification management</li> <li>• rxlip – devices attached to the port can receive change notifications but will not propagate change notifications generated by that port to other ports.</li> </ul> <p><b>Note:</b> Change notifications will be reflected back out of the port if originated by devices attached to this port.</p> <ul style="list-style-type: none"> <li>• txlip – propagates change notifications generated by the port to other ports but will not allow devices attached to the port to receive change notifications from other ports.</li> <li>• nolip – blocks change notifications from being propagated from the port and change notifications from devices on other ports to devices on the port.</li> <li>• Managed – <b>Note:</b> This setting should not be used unless directed to do so by a customer service representative.</li> </ul>
Bypass on OS Error Policy	<p>Ordered set (OS) errors are detected and counted for each individual port. When this policy is enabled, a port is bypassed when its OS count exceeds the threshold setting. The threshold setting is based on the number of ordered set errors identified in 10 seconds.</p> <p><b>Note:</b> This threshold setting can be adjusted.</p>
Bypass on CRC Error Policy	<p>Cyclic Redundancy Check (CRC) errors are detected and counted for each individual port. When this policy is enabled, a port is bypassed when its CRC count exceeds the threshold setting. The threshold setting is based on the number of CRC errors identified in 10 seconds.</p> <p>User intervention is required to return the port into the zone. Recovery methods include replacing the defective component, cycling power to the device on the port, removing and reinserting the bypassed port, or cycling power to the switch.</p> <p><b>Note:</b> This threshold setting can be adjusted.</p>
Bypass on Clock Delta Policy	<p>The switch determines the relative frequency of the signal being received by a port to the internal switch clock. The result of this test allows the determination of how far apart in frequency the switch's clock is in relation to the clock of the received signal – the clock delta. If the clock delta exceeds a set threshold, the switch is notified and the port may be bypassed if necessary. Typically, clock drift is slow enough to allow the removal and replacement of a defective part before the defective part begins to affect system performance.</p>

See the *User's Guide* for the default settings for each Smart Setting.

## Creating a custom Smart Setting (root/config/port/add)

This command creates a new custom Smart Setting. The Smart Setting name can contain any printable character except a comma ',' and may be up to 28 characters in length. Spaces may be included in the name by wrapping the name with quotes. For example, 'custom HBA'.

To create a custom Smart Setting:

From the Port Configuration menu (root/config/port), type `add <custom Smart Setting name>` and press ENTER.

The new Smart Setting is displayed with default attribute values.

To edit the new Smart Setting's attributes:

1. Type the number of the attribute (1-16) to change and press ENTER.  
A list of possible values appears.
2. Type the attribute value and press ENTER.
3. Repeat steps 1 and 2 for the specific attributes to change.
4. When finished, type 17 and press ENTER, or press CTRL-X to save the new Smart Setting and its attributes.

## Editing custom Smart Setting attributes (root/config/port/edit)

This command modifies an existing custom Smart Setting's attributes.

To edit the attributes of a custom Smart Setting:

1. From the Port Configuration menu (root/config/port), type `edit` and press ENTER.  
A list of custom Smart Settings and their associated numbers appears.
2. Type the number of the custom Smart Setting to edit and press ENTER.  
The custom Smart Setting appears with its attribute values.
3. Type the number of the attribute (1-16) to change and press ENTER.  
A list of possible values appears.
4. Type the attribute value and press ENTER.
5. Repeat steps 3 and 4 for the specific attributes to change.
6. When finished, type 17 and press ENTER, or press CTRL-X to save the Smart Setting and its attributes.

## Deleting custom Smart Settings (root/config/port/del)

This command deletes a custom Smart Setting.

To delete a custom Smart Setting:

1. From the Port Configuration menu (root/config/port), type `del` and press ENTER.
2. A list of custom Smart Settings and their associated numbers appears.

3. Type the number of the custom Smart Setting to delete and press ENTER.
4. A message box appears confirming the request.
5. Type `y` and press ENTER to delete the custom Smart Setting.

## Selecting Smart Settings (root/config/port/type)

This command selects a Smart Setting for a specified port. Select from the default Smart Settings provided or select a custom Smart Setting.

To view the Smart Settings currently assigned to the ports:

From the Port Configuration menu (root/config/port), type `type` and press ENTER.

To assign a Smart Setting to a port:

From the Port Configuration menu (root/config/port), type `type <the port number> <the Smart Setting number>` and press ENTER.

**Note:** To see a list of available Smart Settings, type `types` at the command prompt and press ENTER.

For example, to set Port 3 to the Tree Cascade Smart Setting (value=10), type `type 3 10` and press ENTER.

See “Displaying Smart Settings (root/config/port/types)” on page 24 for a list of Smart Setting numbers.

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## Load Balancing configuration menu (root/config/load)

Load balancing builds on the Automatic Trunking functionality by specifying the path that the data uses to flow between multiple switches. Users can manage the switch's aggregate bandwidth by manually distributing traffic across multiple cascade ports as shown below. A cascade port is a port that is attached to another switch of the same type and configured as a String or Tree Cascade Smart Setting. All data flows through the primary cascade, unless the switch is configured differently.

**Note:** Cascade commands must be properly configured before load balancing will work.

### Menu commands

Table 18. Load Balancing configuration menu

Command	Description	Additional Information
1. show	Displays trunk group members.	See page 33.
2. lbclr	Clears the trunk group configuration.	See page 34.
3. delprt	Removes one or more port members from the trunk group.	See page 34.
4. addprt	Adds one or more port members to the trunk group.	See page 34.
5. delalpa	Removes one or more AL_PA members from the trunk group.	See page 35.
6. addalpa	Adds one or more AL_PA members to the trunk group.	See page 35.
7. ialpa	Displays the Initiator AL_PAs.	See page 35.
8. util	Displays the high, average, and low utilization for each port.	See page 35.
9. pu1	Displays the average port utilization interval.	See page 36.
10. pu2	Displays the high/low port utilization interval.	See page 36.
11. ..	Returns to the previous menu.	See page 10.
12. ?	Displays additional information on a command.	See page 10.

## Displaying trunk group members (root/config/load/show)

This command displays all port members and AL\_PAs for a specific trunk group or for all trunk groups.

To display the trunk group members for all ports:

From the Load Balancing configuration menu (root/config/load), type `show` and press ENTER.

To display the trunk group members for a specific port:

From the Load Balancing configuration menu (root/config/load), type `show <port number>` and press ENTER.

To clear the trunk group members for a specific port:

From the Load Balancing configuration menu (root/config/load), type `lbclr <port number>` and press ENTER.

## Clearing trunk group configurations (root/config/load/lbclr)

This command clears all members from being associated with a specific trunk group port. To remove all port members from all trunk groups, use 0 as the port number. When members are removed from a specific trunk group, the members will return to the primary trunk.

To clear the trunk group members for all ports:

From the Load Balancing configuration menu (root/config/load), type `lbclr 0` and press ENTER.

To clear the trunk group members for a specific port:

From the Load Balancing configuration menu (root/config/load), type `lbclr <port number>` and press ENTER.

## Deleting port members from trunk groups (root/config/load/delprt)

This command removes a specific port member from a trunk group. When a member is removed from a specific trunk group, the member will return to the primary trunk.

To delete a port member from a specific trunk group:

From the Load Balancing configuration menu (root/config/load), type `delprt <cascade port number> <port member>` and press ENTER.

**Note:** To delete multiple port members, use spaces or commas between port members.

## Adding port members to trunk groups (root/config/load/addprt)

This command sets the port members associated with a trunk group port for load balancing. There are two ways members can be associated with a port: by port or by AL\_PA. By associating a member to a port, if that port is an active trunk group port, then members associated with that port will be routed on that port.

To add a port member to a specific trunk group:

From the Load Balancing configuration menu (root/config/load), type `addprt <cascade port number> <port members>` and press ENTER.

**Note:** To add multiple port members, use spaces or commas between port members.

## Deleting AL\_PA members from trunk groups (root/config/load/delalpa)

This command removes a specified AL\_PA member from a trunk group. Once removed from the trunk group, the AL\_PA returns to using the primary trunk.

To delete an AL\_PA member from a specific trunk group:

From the Load Balancing configuration menu (root/config/load), type `delalpa <cascade port number> <AL_PA member>` and press ENTER.

**Note:** To delete multiple port members, use spaces or commas between port members.

## Adding AL\_PA members to trunk groups (root/config/load/addalpa)

This command sets the AL\_PA members associated with a trunk group for load balancing. Once assigned to a specific trunk group, the AL\_PA uses the specified trunk for all traffic flow.

To add an AL\_PA member to a specific trunk group:

From the Load Balancing configuration menu (root/config/load), type `addalpa <cascade port number> <AL_PA member>` and press ENTER.

**Note:** To add multiple port members, use spaces or commas between port members.

## Displaying initiator AL\_PAs (root/config/load/ialpa)

This command displays the AL\_PAs that have been detected as initiators. This information is useful when configuring load balancing.

To display Initiator AL\_PA members:

From the Load Balancing configuration menu (root/config/load), type `ialpa` and press ENTER.

## Displaying port utilization (root/config/load/util)

Port utilization measures the amount of traffic running out of a port. For example, if an initiator is transmitting data to a target, the initiator port displays a port utilization value (%) while the target port does not. If the same initiator is receiving data from the target, the target port displays a port utilization value (%) while the initiator port displays does not.

The Port Utilization page displays port utilization for the latest completed intervals based on high, average, and low percentage utilization.

*Table 19. Port utilization information*

Value	Description
High	The high percentage of data communication through a port over a period of time (measured in seconds).
Average	The average percentage of data communication through a port over a period of time (measured in seconds).

Table 19. Port utilization information (continued)

Value	Description
Low	The low percentage of data communication through a port over a period of time (measured in seconds).

To view port utilization for all ports:

From the Load Balancing configuration menu (root/config/load), type `util` and press ENTER.

A list of the port utilization percentages for the High, Average, and Low levels appears.

To view port utilization for a specific port:

From the Load Balancing configuration menu (root/config/load), type `util <port number>` and press ENTER.

A list of the port utilization percentages for the High, Average, and Low levels for that specific port appears.

## Displaying the average port utilization interval (root/config/load/pu1)

This command sets the number of seconds to sample a port for determining average utilization percentage.

To view the average port utilization interval for all ports:

From the Load Balancing configuration menu (root/config/load), type `pu1` and press ENTER.

To adjust the average port utilization interval for a port:

1. From the Load Balancing configuration menu (root/config/load), type `pu1 <port number (1-20)> <interval in seconds (5-3600)>` and press ENTER.
2. Adjust the interval for consecutive ports by separating the ports with a dash (-). For example, to set the interval for ports 5 through 10 to 100 seconds, type `pu1 5-10 100` and press ENTER.

## Displaying the high/low port utilization interval (root/config/load/pu2)

This command sets the number of seconds to sample a port for determining the highest and lowest utilization percentage.

To view the high/low port utilization interval for all ports:

From the Load Balancing configuration menu (root/config/load), type `pu2` and press ENTER.

To adjust the high/low port utilization interval for a port:

1. From the Load Balancing Configuration menu (root/config/load), type `pu2 <port number (1-20)> <interval in seconds (5-3600)>` and press ENTER.
2. Adjust the interval for consecutive ports by separating the ports with a dash (-). For example, to set the interval for ports 5 through 10 to 100 seconds, type `pu2 5-10 100` and press ENTER.



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## Automatic Trunking configuration menu (root/config/trunk)

Multiple links between switches are called 'trunks'. Trunks provide higher bandwidth across cascaded switches for systems incorporating multiple initiators. Each trunk can improve system throughput and provide 'failover' capability. A maximum of 4 trunks between each switch is supported. Trunking is performed automatically when ports are configured properly.

Each trunk is part of a trunk group. A trunk group consists of two or more cascades between two switches. There can only be one trunk group between two switches. Each trunk group contains a primary trunk. All traffic flows through the primary trunk on a switch unless specified otherwise using the Load Balancing feature. The primary trunk is always the lowest numbered port of any trunk group.

If the primary trunk fails, the secondary trunk automatically becomes the primary trunk unless otherwise configured. Multiple cascades also enable switch configuration for better performance through load balancing (see "Load Balancing" on page 33).

The Automatic Trunking configuration menu enables you to configure trunking by defining trunk groups and assigning ports to those groups.

### Menu commands

Table 20. Automatic Trunking configuration menu commands

Command	Description	Additional Information
1. addprt	Adds one or more port members to a trunk port.	See page 37.
2. delprt	Removes one or more port members from a trunk port.	See page 38.
3. showmem	Displays the port members on a trunk port.	See page 38.
4. clr	Clears one or more trunk ports.	See page 38.
5. ..	Returns to the previous menu.	See page 10.
6. ?	Displays additional information on a command.	See page 10.

## Adding port members to trunk groups (root/config/trunk/addprt)

This command adds port members to a trunk group.

To add a port to a trunk:

From the Trunking configuration menu (root/config/trunk), type `addprt <trunk group number> <port members>` and press ENTER.

**Note:** To add multiple port member, use commas between port members.

For example, to add ports 3, 5, and 7 to trunk group 1:

From the Trunking configuration menu (root/config/trunk), type `addprt 1 3,5,7` and press ENTER.

**Note:** This feature should be used with caution as it will override any automated trunking selection already present on the switch. In addition, the automatic features for detecting cascade connections will be disabled.

## Deleting ports members from trunk groups (root/config/trunk/delprt)

This command removes port members from a trunk group. In order to delete a member, the member must be explicitly removed from the trunk group.

To delete a port from a trunk group:

From the Trunking configuration menu (root/config/trunk), type `delprt <trunk group number> <port members>` and press ENTER.

**Note:** To delete multiple port members, use commas between port members.

For example, to remove port members 5 and 7 from trunk group 1, which contains port members 3, 5, and 7:

Type `delprt 1 5,7` and press ENTER.

## Displaying port members on a trunk group (root/config/trunk/showmem)

This command displays the port members within a specific trunk group.

To display the port members in a specific trunk group:

From the Trunking configuration menu (root/config/trunk), type `showmem <trunk group number>` and press ENTER.

To display the port members for all trunk groups:

From the Trunking configuration menu (root/config/trunk), type `showmem` and press ENTER.

## Clearing trunk groups (root/config/trunk/clr)

This command clears all members from a specific trunk group. To remove all members from all trunk groups, use 0 as the trunk group number.

To clear the port members for all trunk groups:

From the Trunking configuration menu (root/config/trunk), type `clr 0` and press ENTER.

To clear the port members for a specific trunk group:

From the Trunking configuration menu (root/config/trunk), type `clr <trunk group number>` and press ENTER.

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## Network configuration menu (root/config/network)

The Network configuration menu displays the current network settings and provides commands for configuring the switch's network settings.

### Menu commands

Table 21. Network configuration menu commands

Command	Description	Additional Information
1. reset	Resets the switch.	See page 39.
2. show	Displays the current network settings.	See page 39.
3. ip	Configures the IP Address setting.	See page 40.
4. mask	Configures the network mask setting.	See page 40.
5. gateway	Configures the default gateway settings.	See page 40.
6. ..	Returns to the previous menu.	See page 10.
7. ?	Displays additional information on a command.	See page 10.

## Hardware reset (root/config/network/reset)

This command resets the switch.

To reset the switch:

1. From the Network configuration menu (root/config/network), type `reset` and press `ENTER`.

If any changes have been made to the switch configuration, a message appears confirming the request to save the current configuration.

2. To save changes and reset the switch, type `y` and press `ENTER`.

To reset the switch without saving changes, type `n` and press `ENTER`.

To cancel the request to reset the switch, type `c` and press `ENTER`.

## Displaying network settings (root/config/network/show)

This command displays the current and saved network settings for the switch, including the IP address, gateway, and netmask. The Current settings are the settings used by the switch at this time. The New settings are the settings that will be used by the switch the next time it is reset.

To view the network settings:

From the Network configuration menu (root/config/network), type `show` and press `ENTER`.

The default IP settings are:

- IP Address: 192.168.1.129
- Netmask: 255.255.255.0
- Gateway: 192.168.1.1

## Configuring the IP address setting (root/config/network/ip)

This command configures the IP address for the switch. The IP address format should be separated by periods. For example, 196.168.1.129.

To change the IP address setting:

1. From the Network configuration menu (root/config/network), type `ip` and press ENTER.

The switch's current IP address setting appears in brackets before the command prompt.

2. Type the new IP address and press ENTER.

The switch's IP address is now saved and becomes active once the switch is reset.

## Configuring the network mask setting (root/config/network/mask)

This command configures the network mask setting for the switch. These changes will become active once the switch is reset. The network mask format should be separated by periods. For example, 255.255.255.0.

To change the network mask setting:

1. From the Network configuration menu (root/config/network), type `mask` and press ENTER.

The switch's current network mask setting appears in brackets before the command prompt.

2. Type the new network mask setting and press ENTER.

The switch's network mask setting is saved and becomes active once the switch is reset.

## Configuring the gateway setting (root/config/network/gateway)

This command configures the default gateway setting for the switch. These changes will become active once the switch is reset. The network mask format should be separated by periods. For example, 196.168.1.1.

To change the default gateway setting:

1. From the Network configuration menu (root/config/network), type `gateway` and press ENTER.

The switch's current default gateway setting appears in brackets before the command prompt.

2. Type the new default gateway setting and press ENTER.

The switch's default gateway setting is saved and becomes active once the switch is reset.

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## One-Step Zoning configuration menu (root/config/zone)

One-Step Zoning allows ports to be divided into multiple virtual zones (or work groups), similar to Virtual Local Area Networking (VLAN). By separating activity on the network, zoning also eliminates change notification propagation (change notifications that occur within one zone cannot propagate to other zones.)

Use zoning to:

- Separate different operating system environments.
- Temporarily block or grant access during backup or other tasks.
- Consolidate equipment logically.
- Designate closed user groups for increased security.
- Separate test or maintenance areas from production areas.

### Menu commands

Table 22. One-Step Zoning configuration menu commands

Command	Description	Additional Information
1. bzht	Configures the Bad Zone Reset Hold Time setting.	See page 42.
2. bzdt	Configures the Bad Zone Delay Time setting.	See page 42.
3. addprt	Adds one or more port members to a zone.	See page 42.
4. delprt	Removes one or more port members from a zone.	See page 43.
5. showmem	Displays the port members within a zone.	See page 43.
6. act	Activates the zone set.	See page 43.
7. deact	Deactivates the zone set.	See page 43.
8. zstate	Displays the state of specified zone.	See page 44.
9. zclr	Clears one or more zones.	See page 44.
10. addblk	Adds an AL_PA blocking member to a group.	See page 44.
11. delblk	Removes an AL_PA block member from a group.	See page 46.
12. showblks	Displays the AL_PA blocking groups.	See page 46.
13. hz	Configures the Hard Zone policy setting.	See page 46.
14. bzs	Configures the Bad Zone Recovery policy setting.	See page 47.
15. alpas	Displays the zone AL_PAs.	See page 48.
16. ..	Returns to the previous menu.	See page 10.
17. ?	Displays additional information on a command.	See page 10.

## Setting the Bad Zone Recovery Reset Hold Time (root/config/zone/bzht)

The Bad Zone Recovery Hold Time is the amount of time that the switch keeps the ports in bypass mode before attempting to re-insert the ports into the zone. This setting is measured in milliseconds (.001 seconds). The default Reset Hold Time setting is 100.

To change the time interval:

1. From the Zoning configuration menu (root/config/zone), type `bzht` and press ENTER. The current time interval appears in brackets before the command prompt.
2. Type the new time interval and press ENTER. The valid range is 10 to 1000 milliseconds (mSec).

## Setting the Bad Zone Recovery Delay Time (root/config/zone/bzdt)

The Bad Zone Recovery Delay Time is the amount of time that the switch waits after a zone goes down before attempting to recover the zone. This setting is measured in seconds. The default Delay Time setting is 5.

To change the time interval:

1. From the Zoning configuration menu (root/config/zone), type `bzdt` and press ENTER. The current time interval appears in brackets before the command prompt.
2. Type the new time interval and press ENTER. The valid range is 1 to 32 seconds.

## Adding a port member to a zone (root/config/zone/addprt)

This command adds a port to a zone. Each port may be added to zones 1-11. Zone 0 is the default zone and is not user definable. Zone 0 contains all ports not included in zones 1-11.

When displaying the zone information and zoning is not active, Zone 0 displays all ports. If zoning is active, Zone 0 only shows the ports currently active in Zone 0.

**Note:** Changes to zone configurations require that zoning be active. See “Activating zoning (root/config/zone/act)” on page 43.

To add a port to a zone:

From the Zoning configuration menu (root/config/zone), type `addprt <zone number> <port numbers>` and press ENTER.

**Note:** To add multiple port members, use spaces or commas between port members.

For example: If Zone 1 will consist of an HBA (port 3) and two targets (ports 5 and 7) then to create Zone 1, type `addprt 1 3,5,7` and press ENTER.

## Removing a port member from a zone (root/config/zone/delprt)

This command deletes a port from a zone. Each port may belong to zones 1-11. Ports cannot be deleted from Zone 0 since zone 0 is a special zone managed by the unit. Zone 0 contains all of the ports not associated with other zones.

If zoning is not active, then zone 0 displays all ports. If zoning is active, zone 0 only shows those ports not included in other zones.

**Note:** Changes to zone configurations require that zoning be active. See “Activating zoning (root/config/zone/act)” on page 43.

To remove a port from a zone:

From the Zoning configuration menu (root/config/zone), type `delprt <zone number> <port numbers>` and press ENTER.

**Note:** To delete multiple port members, use spaces or commas between port members.

For example: If Zone 1 consists of an HBA (port 3) and two targets (ports 5 and 7), then to remove the target on port 7, type `delprt 1 7` and press ENTER.

## Displaying port members within a zone (root/config/zone/showmem)

This command displays the port members for a specified zone or for all zones. Zone 0 is the default zone and is managed by the switch. Zone 0 shows the current active configuration in the unit.

If zoning is not active, zone 0 displays all ports. If zoning is active, zone 0 only shows those members not in the other zones.

To view the ports in all zones:

From the Zoning configuration menu (root/config/zone), type `showmem` and press ENTER.

To view the ports in a specific zone:

From the Zoning Configuration menu (root/config/zone), type `showmem <zone number>` and press ENTER.

## Activating zoning (root/config/zone/act)

This command activates zoning on the switch. If zoning is not active, this command sets up the corresponding hardware to enforce the defined zones. If zoning is already active, this command reloads the zoning parameters.

To activate zoning:

From the Zoning configuration menu (root/config/zone), type `act` and press ENTER.

## Deactivating zoning (root/config/zone/deact)

This command deactivates zoning on the switch. If zoning is active, this command places all ports into a normal, non-zoned state.

To deactivate zoning:

From the Zoning configuration menu (root/config/zone), type `deact` and press ENTER.

## Displaying the zone state (root/config/zone/zstate)

This command displays the current zone state for a specified zone or all zones. The zone state may be "up" (operational) or "down" (non-operational).

To view the zone state for all zones:

From the Zoning Configuration menu (root/config/zone), type `zstate` and press ENTER.

To view the zone state for a specific zone:

From the Zoning configuration menu (root/config/zone), type `zstate <zone number>` and press ENTER.

## Clearing zones (root/config/zone/zclr)

This command clears out the port members from a specified zone. If the specified zone is 0, it will clear all of the zones.

To clear a specific zone:

From the Zoning Configuration menu (root/config/zone), type `zclr <zone number>` and press ENTER.

To clear all zones:

From the Zoning configuration menu (root/config/zone), type `zclr 0` and press ENTER.

## Adding an AL\_PA blocking member to a group (root/config/zone/addblk)

This command adds an AL\_PA member to an AL\_PA blocking group to set up a route blocking zone and prevent devices (using AL\_PAs) from accessing one another.

AL\_PA zoning fully ensures that devices will not access each other. It does this by blocking a group of devices from sending OPN signals to each other but allows the devices to send OPNs outside of the group. This group of devices is called a "route block zone", not to be confused with the port zones discussed earlier. Port zoning without route blocking makes the separated ports unaware of each other, but this does not prevent all OPN signals from getting through. Therefore, it is recommended that you create a route block zone and include any AL\_PAs that should not access each other.

**Note:** Zoning must be activated for route blocking to work properly.



Using the example in Figure 2, suppose you want to restrict Host 1 from accessing sensitive data on Drive 2. AL\_PAs 01 and E8 should be added to a route block zone.

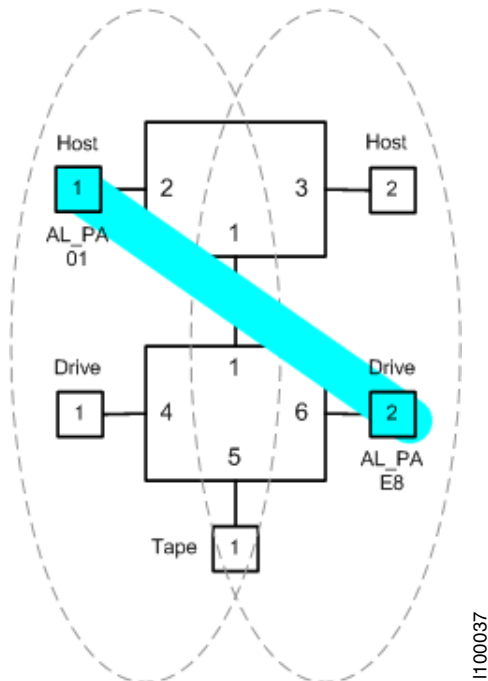


Figure 2. Route block zone

To add an AL\_PA member to a blocking group:

From the Zoning configuration menu (`root/config/zone`), type `addblk <group number> <AL_PA member>` and press ENTER

**Note:** Changes to zone configurations require that zoning be active. See “Activating zoning (`root/config/zone/act`)” on page 43.

For example: There are two HBAs and a target connected to a switch and you want to isolate the HBAs so that they do not see one another.

- HBA1 (Port 1, AL\_PA 02).
- HBA2 (Port 2, AL\_PA 04).
- Target1 (Port 3, AL\_PA EF).

To block the HBAs from seeing each other:

1. Type `addblk 1 02` and press ENTER.  
This adds HBA1 to blocking group 1.
2. Type `addblk 1 04` and press ENTER.  
This adds HBA2 to blocking group 1.

**Note:** If the AL\_PAs are on the same port, the switch will not be able to block access

3. Ensure zoning is activated and reset the switch for the changes to become active on the switch.

## Removing an AL\_PA blocking member from a group (root/config/zone/delblk)

This command deletes an AL\_PA member from an AL\_PA blocking group.

To remove an AL\_PA member from a blocking group:

From the Zoning configuration menu (root/config/zone), type `delblk <group number> <AL_PA member>` and press ENTER.

**Note:** Changes to blocking configurations require that zoning be active. See “Activating zoning (root/config/zone/act)” on page 43.

For example: There are two HBAs in blocking group 1 and you want to remove HBA2 from the blocking group.

- HBA1 (Port 1, AL\_PA 02).
- HBA2 (Port 2, AL\_PA 04).

To remove HBA2 from blocking group 1:

1. Type `delblk 1 04` and press ENTER.

This removes HBA2 from blocking group 1.

2. Ensure zoning is activated and reset the switch for the changes to become active on the switch.

## Displaying AL\_PA blocking groups (root/config/zone/showblks)

This command displays the route blocking configuration for all route blocking groups.

To view the AL\_PA blocking groups:

From the Zoning configuration menu (root/config/zone), type `showblks` and press ENTER.

## Configuring the Hard Zone policy (root/config/zone/hz)

This command displays and configures the hard zone policy for a specific zone.

**Note:** Zone 0 is reserved and cannot be configured for hard zoning.

A hard zone can be used to add a separate 126 AL\_PAs that operate in isolation from any other zone. A hard zone disables switching functionality and creates a shared connection between the ports in a zone topology, splitting the switch into multiple unique FC-AL zones. When hard zoning is enabled, all switch zones must be hard zones. A combination of hard zones and regular zones on a single switch is not allowed.

**Note:** Do not set a hard zone for ports in multiple zones or share ports that have the Hard Zone option set. This will cause errors that do not log an event or display a message.

The advantages of hard zoning include:

- Each hard zone contains 126 available AL\_PAs.
- The switch can be configured to contain up to eleven isolated hard zones.

The limitations of hard zoning include:

- 2 Gb of shared bandwidth over the entire hard zone.
- Ports in a hard zone cannot use the Stealth Intelligent Change Manager.
- Automatic Trunking and route blocking are not allowed in a hard zone.
- Ports in a hard zone cannot be set to a string or tree cascade configuration.
- Device AL\_PAs on a port in a hard zone cannot be displayed.

To view the current hard zone policy for each zone:

From the Zoning configuration menu (root/config/zone), type `hz` and press ENTER.

To configure the hard zone policy for a specific zone:

1. From the Zoning configuration menu (root/config/zone), type `hz <zone number> <policy setting>` and press ENTER.

*Table 23. Hard Zone policy settings*

Policy Setting	Description
1	Enable hard zoning.
2	Disable hard zoning.

2. Ensure zoning is activated and reset the switch for the changes to become active on the switch.

## Configuring the Bad Zone Recovery policy (root/config/zone/bzr)

This command displays and configures the bad zone recovery policy for a specific zone. This policy automatically recovers traffic after a device has brought down the zone. The switch continuously watches the state of each zone and detects when a failed zone has not recovered on its own. The switch then bypasses and re-inserts every port within the zone. However, the Port Test Before Insertion (PTBI) policy does not allow the offending port to re-insert the zone, which allows all other devices to operate normally.

**Note:** Bad zone recovery is enabled by default. If bad zone recovery is disabled, use the following instructions to enable this policy for the appropriate zones.

To view the current bad zone recovery policy for each zone:

From the Zoning configuration menu (root/config/zone), type `bzr` and press ENTER.

To configure the bad zone recovery policy for a specific zone:

1. From the Zoning configuration menu (root/config/zone), type `bzr <zone number> <policy setting>` and press ENTER.

*Table 24. Bad Zone Recovery policy settings*

Policy Setting	Description
1	Enable the Bad Zone Recovery policy.
2	Disable the Bad Zone Recovery policy.

2. Ensure zoning is activated and reset the switch for the changes to become active on the switch.

## Displaying zone AL\_PAs (config/zone/alpas)

This command displays the AL\_PAs for a specific zone or for all zones.

To view the AL\_PAs for all zones:

From the Zoning configuration menu (root/config/zone), type `alpas` and press ENTER.

To view the AL\_PAs for a specific zone:

From the Zoning configuration menu (root/config/zone), type `alpas <zone number>` and press ENTER.

## Chapter 3. Diagnostics menu (root/diag)

The Diagnostics menu provides commands for determining and correcting issues with normal switch operation.

### Menu commands

Table 25. Diagnostic menu commands

Command	Description	Additional Information
1. galpa	Displays the port AL_PAs.	See page 49.
2. glim	Displays the Zone Initialization Master port.	See page 49.
3. os	Displays the detected ordered sets.	See page 50.
4. ps	Displays the port state.	See page 51.
5. delta	Displays the port clock delta.	See page 51.
6. showpri	Displays the primary ports and the associated duplicates.	See page 52.
7. prtctrs	Displays the error counters for one or more ports.	See page 52.
8. clrctr	Clears the counters.	See page 52.
9. beacon	Beacons a port.	See page 52.
10. con	Displays information on the connected device.	See page 53.
11. who	Displays information on the device that caused a change notification.	See page 53.
12. ialpa	Displays the Initiator AL_PAs.	See page 53.
13. ..	Returns to the previous menu.	See page 10.
14. ?	Displays additional information on a command.	See page 10.

### Displaying port AL\_PAs (root/diag/galpa)

This command displays all AL\_PAs for a single port or for all ports.

To view the AL\_PAs for all ports:

From the Diagnostics menu (root/diag), type `galpa` and press ENTER.

To view the AL\_PAs for a specific port:

From the Diagnostics menu (root/diag), type `galpa <port number>` and press ENTER.

### Displaying LIM port (root/diag/glim)

This command displays the Loop Initialization Master (LIM) port for a single zone or for all zones. The LIM port is responsible for starting the change notification process in each zone.

To view the LIM ports for all zones:

From the Diagnostics menu (root/diag), type `glim` and press ENTER.

To view the LIM port for a specific zone:

From the Diagnostics menu (root/diag), type `glim <zone number>` and press ENTER.

## Displaying detected ordered sets (root/diag/os)

This command displays the detected ordered sets for a single port or for all ports.

To view the detected ordered sets for all ports:

From the Diagnostics menu (root/diag), type `os` and press ENTER.

To view the detected ordered sets for a specific port:

From the Diagnostics menu (root/diag), type `os <port number>` and press ENTER.

A list of detections and their indications follows:

*Table 26. Detected ordered sets*

<b>Detection</b>	<b>Indication</b>
User Match	The ordered set or pattern selected under the Match area has been detected.
EOF (End of Frame)	An End-of-Frame (EOF) delimiter has been detected; frames are present. (An EOF immediately follows the CRC of a frame and signals the frame's end.)
SOF (Start of Frame)	A Start-of-Frame (SOF) delimiter has been detected; frames are present.
Idle	Sequences of IDLEs are being transmitted to maintain link activity; no other data is being transmitted.
ARBFF	ARB(FF)s are being transmitted to maintain link activity; no other data is being transmitted.
ARB	A port is arbitrating for network access to perform a task.
RRDY (Read Ready)	The receiving node on this port has sent an R_RDY signal, indicating that it is ready for a frame to be transmitted over the link.
CLS (Close)	The port is attempting to begin the process of closing the current FC-AL circuit.
OPN (Open)	The port is attempting to open communications with another port. <b>Note:</b> As is the case with some ordered sets, an OPN may not go all the way around the FC-AL, instead stopping at its destination.

Table 26. Detected ordered sets (continued)

Detection	Indication
LIPF8 (F8 Failure)	A non-switching port has detected a failure on its receive input, is notifying other ports, and is determining whether the network is still operational. Some events that could cause the port to detect network failure follow: <ul style="list-style-type: none"> <li>• A device has failed.</li> <li>• A device has been powered off.</li> <li>• The physical connection between the transmitter and receiver is broken.</li> <li>• Activating the port bypass circuit does not typically result in a network failure.</li> </ul>
LIPF7 (F7 Initialization)	A port is in the non-participating mode and is attempting to win arbitration and begin initialization, possibly because the port was reset or is powering up. Sometimes the port is sending this sequence to another hot-cascaded switch, like a new initiator being inserted in the network.
LIP (Change Notification)	A change notification has been detected and action has been taken.
Unknown	The switch cannot determine what is being transmitted.
Invalid	An invalid transmit word has been detected.
CRC Error	A Frame CRC error has been detected.
PT to PT (Point-to-Point)	A point-to-point connection has been detected.

## Displaying port state (root/diag/ps)

This command displays the port states and conditions for a single port or for all ports.

To view the port state and condition for all ports:

From the Diagnostics menu (root/diag), type `ps` and press ENTER.

To view the port state and condition for a specific port:

From the Diagnostics menu (root/diag), type `ps <port number>` and press ENTER.

## Displaying port clock delta (root/diag/delta)

This command displays the port clock deltas for a single port or for all ports. The port clock delta is the difference (in parts per million) between the internal clock and the received clock signal on the port.

To view the port clock delta for all ports:

From the Diagnostics menu (root/diag), type `delta` and press ENTER.

To view the port clock delta for a specific port:

From the Diagnostics menu (root/diag), type `delta <port number>` and press ENTER.

## Displaying primary ports (root/diag/showpri)

This command displays the primary ports and associated duplicates for a single port or for all ports.

To view the primary port and associated duplicates for all ports:

From the Diagnostics menu (root/diag), type `showpri` and press ENTER.

To view the primary port and associated duplicates for a specific port:

From the Diagnostics menu (root/diag), type `showpri <port number>` and press ENTER.

## Displaying port error counters (root/diag/prtctrs)

This command displays the ordered set, CRC, and Insertion errors for a single port or for all ports.

To view the errors for all ports:

From the Diagnostics menu (root/diag), type `prtctrs` and press ENTER.

To view the errors for a specific port:

From the Diagnostics menu (root/diag), type `prtctrs <port number>` and press ENTER.

## Clearing counters (root/diag/clrctr)

This command clears the port counters.

To clear the error counters for all ports:

From the Diagnostics menu (root/diag), type `clrctr` and press ENTER.

## Beaconing ports (root/diag/beacon)

This command flashes (beacons) a port's LEDs to indicate that the port needs attention. Typically used when troubleshooting port problems.

To view the current port beaconing settings:

From the Diagnostics menu (root/diag), type `beacon` and press ENTER.

To beacon a port:

From the Diagnostics menu (root/diag), type `beacon <port number> 1` and press ENTER.

The port's LEDs start flashing.

To stop beaconing a port:

From the Diagnostics menu (root/diag), type `beacon <port number> 2` and press ENTER. The port's LEDs return to normal operation.

Multiple, consecutive ports can be specified by using a dash (-). For example, to beacon ports 3, 4, and 5, type `beacon 3-5 1`.



## Displaying connected device information (root/diag/con)

This command displays the connected device information including the device ID, connected port number, and Stealth settings for one or more ports.

To view device information for all ports:

From the Diagnostics menu (root/diag), type `con` and press ENTER.

To view device information for a specific port:

From the Diagnostics menu (root/diag), type `con <port number>` and press ENTER.

## Displaying change notification information (root/diag/who)

Displays the port number from which the last change notification initiated.

To view the port:

From the Diagnostics menu (root/diag), type `who` and press ENTER.

## Displaying initiator AL\_PAs (root/diag/ialpa)

This command displays the AL\_PAs that have been detected by the switch and identified as initiators. Initiators are detected when a device is opened.

To view the initiator AL\_PAs:

From the Diagnostics menu (root/diag), type `ialpa` and press ENTER.



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## Chapter 4. Show menu (root/show)

Users can view all of the switch's current settings (including system, port, zone, and version settings) at either the Show menu or, for some settings, the specific submenu.

The Show menu provides information on current switch settings.

### Menu commands

Table 27. Show menu commands

Command	Description	Additional Information
1. events	Displays the event log.	See page 55.
2. ptype	Displays the attributes for a Smart Setting.	See page 56.
3. portinfo	Displays port configuration information.	See page 56.
4. prtctrs	Displays the error counters for one or more ports.	See page 56.
5. clrctr	Clears the counters.	See page 56.
6. sysinfo	Displays system information.	See page 57.
7. zninfo	Displays zone information.	See page 58.
8. lbinfo	Displays load balancing information.	See page 58.
9. os	Displays the detected ordered sets.	See page 59.
10. galpa	Displays the port AL_PAs.	See page 59.
11. glim	Displays the Loop Initialization Master (LIM) port.	See page 59.
12. sensors	Displays sensor information.	See page 59.
13. getcon	Displays the connected device ID.	See page 60.
14. sync	Displays the PLL lock status.	See page 60.
15. dump	Displays the switch settings.	See page 60.
16. sid	Displays the SFP serial data.	See page 61.
17. zalpas	Displays the zone AL_PAs.	See page 61.
18. ..	Returns to the previous menu.	See page 10.
19. ?	Displays additional information on a command.	See page 10.

### Displaying events (root/show/events)

This command displays the event log entries (up to 3000 messages) generated by the switch. For a list of the severity levels and event messages, see Appendix A. Event messages on page 67.

To view the event log:

From the Show menu (root/show), type `events` and press ENTER.

To continue to list event messages:

Press ENTER.

To view all remaining event log messages:

Type `a` and press ENTER.

To quit viewing the event log messages:

Press CTRL-X.

## Displaying Smart Settings (root/show/ptype)

This command displays the available Smart Settings (port types). For a list of available Smart Settings, see the *User's Guide*.

To view the Smart Settings:

From the Show menu (root/show), type `view <port type number>` and press ENTER.

## Displaying port configuration information (root/show/portinfo)

This command displays the port configuration and policy settings.

To view the port configuration and policy settings:

1. From the Show menu (root/show), type `show` and press ENTER.  
A list of port configuration information appears for each port.
2. Press ENTER again to view the policy settings assigned to each port.  
The policy settings for each port appear.

To quit viewing the settings:

Press CTRL-X.

For additional information on the port configuration and policy settings, see the *User's Guide*.

## Displaying port error counters (root/show/prtctrs)

This command displays the ordered set, CRC, and Insertion errors for a single port or for all ports.

To view the errors for all ports:

From the Show menu (root/show), type `prtctrs` and press ENTER.

To view the errors for a specific port:

From the Show menu (root/show), type `prtctrs <port number>` and press ENTER.

## Clearing counters (root/show/clrctr)

This command clears the port counters.

To clear the error counters for all ports:

From the Show menu (root/show), type `clrctr` and press ENTER.

## Displaying system information (root/show/sysinfo)

This command displays the current switch information.

To display current switch information:

From the Show menu (root/show), type `sysinfo` and press ENTER.

The system information includes the following:

*Table 28. System information*

Setting	Description
System Name	The name assigned to the switch.
Location	The location assigned to the switch.
MAC ID	A unique device address (MAC address) assigned to each switch at the factory. Cannot be configured or modified.
Serial Number	A unique identification number assigned to each switch at the factory. This field can only be configured or modified on Field Replaceable Units (FRUs).
Switching Mode	When 'on', the switch is able to direct data to specific ports using full bandwidth. When 'off', bandwidth is split among the ports and data is sent around the network as in a shared FC-AL architecture.
OS Error Threshold	The maximum number of OS errors allowed in a 10-second interval before a port is bypassed. Setting this value to '0' uses the factory default setting.
CRC Error Threshold	The maximum number of CRC errors allowed in a 10-second interval before a port is bypassed. Setting this value to '0' uses the factory default setting.
Blocking Arbitration	When two ports start a communication session, the Blocking ARB is sent to all other ports trying to communicate with those ports until the connection is terminated. The default setting is 'FF'. If other connected devices use the 'FF' setting for another purpose, select another Blocking ARB value (for example, 'FB').
Switch FW Version	The current firmware loaded onto the switch. The current version can be replaced by an alternate version that you have previously loaded onto the switch.
SOC Version	The SOC 320 version that is used in the switch. Cannot be configured or modified.
Switch HW Version	The hardware version of the switch. Cannot be configured or modified.
MIB Version	The proprietary Management Information Base version that is supported through SMP. Cannot be configured or modified.
Speed	The current speed per port at which the switch is running. All ports operate at the same speed. The default switch speed is set to 2.125 Gb/s.

Table 28. System information (continued)

Setting	Description
Fault Status	The current status of the switch.
InSpeed SOC Status	The current status of the InSpeed SOC chipset.
Current Time	The switch's current date and time.
System Up Time	The duration of time that the switch has been operational. If the switch is rebooted or power is cycled, this value is reset.
IP Address	The current IP Address for the switch.
Netmask	The current IP Netmask address for the switch.
Default Gateway	The current Gateway address for the switch.

## Displaying zone information (root/show/zninfo)

This command displays zone status (enabled or disabled) and current zone information, including the zone number, current state, LIM, and Up Count.

To view zone information:

From the Show menu (root/show), type `zninfo` and press ENTER.

## Displaying Load Balancing information (root/show/lbinfo)

This command displays the current load balancing information, including port number, port members, and associated AL\_PAs.

To view load balancing information:

1. From the Show menu (root/show), type `lbinfo` and press ENTER.

A list of ports and their associated port members and AL\_PAs appears.

2. Press ENTER to continue.

A list of ports and their associated modes and utilization percentages appears.

Table 29. Load Balancing information

Value	Description
Mode	(1) timeOpen—When switching mode is enabled, this value measures the percentage of time that the port is involved in a connection, regardless of the amount of data that is being sent.  (2) framesSeen—When switching mode is disabled, this value measures the amount of frame data passing through the port.
Utilization (%)	Displays the utilization percentage for each port based on the mode.

## Displaying detected ordered sets (root/show/os)

This command displays the detected ordered sets for a single port or for all ports.

To view the detected ordered sets for all ports:

From the Show menu (root/show), type `os` and press ENTER.

To view the detected ordered sets for a specific port:

From the Show menu (root/show), type `os <port number>` and press ENTER.

For a list of ordered set detections and their indications, see Chapter 3: Displaying detected ordered sets (root/diag/os) on page 50.

## Displaying port AL\_PAs (root/show/galpa)

This command displays all of the AL\_PAs for a single port or for all ports. This information is useful when configuring load balancing and route blocking.

To view the AL\_PAs for all ports:

From the Show menu (root/show), type `galpa` and press ENTER.

To view the AL\_PAs for a specific port:

From the Show menu (root/show), type `galpa <port number>` and press ENTER.

## Displaying LIM port (root/show/glim)

This command displays the Loop Initialization Master (LIM) port for a single zone or for all zones. The LIM port is responsible for starting the change notification process in each zone.

To view the LIM ports for all zones:

From the Show menu (root/show), type `glim` and press ENTER.

To view the LIM port for a specific zone:

From the Show menu (root/show), type `glim <zone number>` and press ENTER.

## Displaying sensor information (root/show/sensors)

This command displays switch sensor information, including enclosure temperature and fan status.

To view switch sensor information:

From the Show menu (root/show), type `sensors` and press ENTER.

Table 30. Sensor information

Setting	Indicator
Enclosure Temperature	Nominal (green)—the switch temperature is within the normal operating range. OverTemp (red)—the enclosure temperature has exceeded the recommended operating range (above 45°C).
Fan	Nominal (green)—the fan unit is working properly. Not Present (yellow)—the fan unit has been removed or cannot be detected. Fault (red)—the fan unit has stopped operating.

## Displaying connected device IDs (root/show/getcon)

This command displays the type of connection for a single port or for all ports. A connection type of SEOC means that the switch has discovered and successfully connected to a SEOC-enabled device.

To view the connected device IDs for all ports:

From the Show menu (root/show), type `getcon` and press ENTER.

To view the connected device ID for a specific port:

From the Show menu (root/show), type `getcon <port number>` and press ENTER.

## Displaying PLL lock status (root/show/sync)

This command displays the Phase Loop Lock (PLL) status for a single port or for all ports. The PLL indicates whether the port is operational or not.

To view the synchronization status for all ports:

From the Show menu (root/show), type `sync` and press ENTER.

To view the synchronization status for a specific port:

From the Show menu (root/show), type `sync <port number>` and press ENTER.

## Displaying switch settings (root/show/dump)

This command displays the current switch settings in XML-tagged format.

**Note:** This command generates and outputs a significant amount of data. It may take some time before results are displayed.

To view the switch settings:

1. From the Show menu (root/show), type `dump` and press ENTER.

A message appears confirming the request.

2. Type `y` and press ENTER.



**Note:** HyperTerminal® users can capture the entire switch setting display by enabling the text capture feature. To enable this feature, click **Transfer > Capture Text** and designate the location and filename for the file. Once this feature is enabled, proceed with the instructions above. When the system is finished downloading the switch information, open the text file to view the settings.

## Displaying SFP serial ID information (root/show/sid)

This command displays information (if available) about an inserted SFP transmitter for a specific port.

To view the SF serial data for a specific port:

From the Show menu (root/show), type `sid <port number>` and press ENTER.

## Displaying zone AL\_PAs (root/show/zalpas)

This command displays AL\_PAs for a single zone or for all zones.

To view the AL\_PAs for all zones:

From the Show menu (root/show), type `zalpas` and press ENTER.

To view the AL\_PAs for a specific zone:

From the Show menu (root/show), type `zalpas <zone number>` and press ENTER.



## Chapter 5. Firmware menu (root/fw)

This section displays the current and alternate firmware versions, enables you to select which firmware version to run the next time the switch is reset, and provides a means to load new firmware on the switch.

### Menu commands

Table 31. Firmware menu commands

Command	Description	Additional Information
1. tftp	Loads a new firmware image using TFTP.	See page 63.
2. xmodem	Loads a new firmware image using XMODEM.	See page 64.
3. revert	Changes the alternate image to the active image after the switch is reset.	See page 65.
4. show	Displays the current firmware information.	See page 65.
5. reset	Resets the switch.	See page 65.
6. ..	Returns to the previous menu.	See page 10.
7. ?	Displays additional information on a command.	See page 10.

### Loading a new image using TFTP (root/fw/tftp)

This command loads a new firmware image from the host system to the switch through a Trivial File Transfer Protocol (TFTP) server on the switch.

To download firmware from a binary file using TFTP:

1. From the Firmware menu (root/fw), type `tftp` and press ENTER. The following message appears:

```
Start TFTP Transfer to m: from host shell.
```

```
Example: c:\tftp -i 192.168.11.171 put filename.bin m:
```

After transfer, select one of the following:

- 1) Verify and Store
- 2) Abort

*Figure 3. TFTP download message*

2. For Windows workstations, open a new DOS window and locate the directory containing the new firmware, type the following (where *IPaddress* is the switch's IP Address and *filename* is the name of the binary firmware file):

```
tftp -i <IPaddress> put <filename.bin> m: and press ENTER.
```

Within a few seconds, the "Transfer successful" message appears in the window. (If this message does not appear, verify that the file location and name were properly entered, and repeat the transfer.)

3. In the terminal session window, type `1` to verify and store the new firmware.

The "Program Load Successful" message appears.

4. Type `show` and press ENTER.  
The active and alternate firmware versions appear.
5. Type `reset` to reboot the switch to activate the new image.

### Unix Instructions

Unix users should replace step #2 above with the following instructions:

1. At a Unix prompt, type `tftp <IPaddress>` (where `IPaddress` is the switch's IP Address) and press ENTER.
2. Type `binary` and press ENTER.
3. Type `put <filename> /ram` (where `filename` is the name of the binary firmware file) and press ENTER.  
A message appears confirming that the file was sent.
4. Type `quit` and press ENTER.

## Loading a new image using Xmodem (root/fw/xmodem)

This command loads a new firmware image from the host system to the switch using the HyperTerminal® program and the serial port.

**Note:** The HyperTerminal session's baud rate should be set to 115200 for Xmodem transfers. To configure the baud setting, click **File > Properties**. Under the Settings tab, click **Configure** and set the bits per second to 115200. If a connection to the switch is already established, disconnect from the switch before changing the baud setting.

To download firmware using HyperTerminal via the serial port:

1. From the Firmware menu (root/fw), type `xmodem` and press ENTER.

The following message appears:

```
Within serial console, start image download using
XMODEM file transfer protocol.
```

```
-----
XMODEM - File Transfer Facility
-----
Send several Control-X characters to cancel.
```

*Figure 4. XMODEM download start message*

2. In HyperTerminal, click **Transfer > Send File**.
3. Set the protocol to **Xmodem**.
4. Click **Browse** to locate the firmware file on the host system.
5. Double-click the firmware filename to select it and click **Send**.

After the firmware is downloaded, the following message appears:

```
Change baud rate back to 19200 ?(y/n) :
```

*Figure 5. XMODEM download baud rate message*

6. Type `y` and press ENTER.

The following message appears:

```
Transfer Complete. Verifying file integrity....  
Verification Complete. Copying to Flash.....  
Flash Copy Complete.  
Download Complete.  
New image will become active upon reset.
```

OK

*Figure 6. XMODEM download complete message*

7. Type `show` and press ENTER.  
The active and alternate firmware versions appear.
8. Type `revert` and press ENTER to use the alternate firmware image (the new image that was downloaded) the next time the switch is reset.
9. Type `reset` and press ENTER to reboot the switch to activate the new image.

## Changing firmware images (root/fw/revert)

This command sets the alternate image to become the active image on the next switch reset.

To revert to the alternate firmware image:

From the Firmware menu (root/fw), type `revert` and press ENTER.

## Displaying current firmware information (root/fw/show)

This command displays information for the current active, alternate, and boot firmware images.

To view the current firmware information:

From the Firmware menu (root/fw), type `show` and press ENTER.

```
Internal Firmware Versions:  
-----  
ACTIVE:      V2.08 (build 2)      Jun  2 2004   23:59:32  
ALTERNATE:   V2.08 (build 1)      May 24 2004   03:32:06  
BOOT:        V1.00 (build 1)      May 24 2004   03:32:01
```

*Figure 7. Firmware information display*

## Hardware reset (root/fw/reset)

This command resets the switch hardware.

To reset the switch:

1. From the Firmware menu (root/fw), type `reset` and press ENTER.

If any changes have been made to the switch configuration, a message appears confirming the request to save the current configuration.

2. To save changes and reset the switch, type `y` and press ENTER.  
To reset the switch without saving changes, type `n` and press ENTER.  
To cancel the request to reset the switch, type `c` and press ENTER.

## Appendix A. Event messages

The L10 storage switch's event messages are listed below. For explanations, contact a customer service representative. The message's applicable severity level as defined below are given before each message.

Table 32. Event message severity levels

Severity Level	Severity	Description
1	EMERG	Immediate action required; system failing
2	ALERT	Unrecoverable condition reported; major event in progress
3	CRIT	Event failed with possible loss of integrity
4	ERR	Condition failed; action required
5	WRN	Failed event occurred; no action required
6	NOTIFY	Configuration error or abnormal event occurred; no action required
7	INFO	Event occurred; no action required

These severity levels can be used to designate which events trigger trap messages. Using the Command Line Interface (CLI), you can designate the minimum severity level of events to be logged in the Event Log and at which to illuminate the switch's Fault LED.

Table 33. Event messages

Event	Event Message	Severity
1	Message log cleared	INFO
5	Power Supply Failed	ALERT
6	Power Supply Online	NOTIFY
9	Fan has stopped	EMERG
10	Fan has returned	ALERT
19	Temperatures over limit	ALERT
20	Temperature OK	INFO
50	SPF Overvoltage	EMERG
54	SOC has detected a CRC error in the EEPROM	NOTIFY
70	Port # bypassed	NOTIFY
71	Port # inserted	NOTIFY
72	Transceiver detected at Port #	NOTIFY
73	Transceiver removed at Port #	NOTIFY
74	SEOC occurred on Port #	NOTIFY
75	Port # exceeded OS threshold	NOTIFY
76	Port # exceeded CRC threshold	NOTIFY
77	Loop UP on Port #	NOTIFY
78	Loop DOWN on Port #	NOTIFY
79	Port # received a LIP(F8)	WRN
80	Port # CRC Error detected in frame	WRN
81	Port # did not receive LIP(F7) within timeout	WRN

Table 33. Event messages (continued)

Event	Event Message	Severity
83	Segment stall on Port #	NOTIFY
84	Bad Open on Port #	WRN
85	Error during Port Disc.	NOTIFY
86	Port # PTBI failed due to timeout	NOTIFY
87	Port # changed to <state>	NOTIFY
88	Transceiver in Port # has been cycled	NOTIFY
89	Port # has cycled between insert/bypassed (not necessarily in that order)	NOTIFY
90	Loop CYCLED on Port #	NOTIFY
91	Port exceeded Clk Delta threshold	INFO
95	Interframe has been received	INFO
96	Interswitch link added/removed	INFO
97	LIP Cycle Timeout	INFO
98	API Initialized OK	INFO
99	Selftest failure	ERR
100	Received Unknown event	INFO
101	CRC detected on either an ISL LIP or Generic Frame	NOTIFY
107	Trap task failed to update trap destination info.	CRIT
135	CLI level 1 password changed	NOTIFY
136	CLI level password changed to default setting	NOTIFY
150	Web level 1 password changed	NOTIFY
151	Web password level changed to default setting	NOTIFY
165	System config reset to factory default	ERR
166	New Port Config Type added	NOTIFY
167	Port Config Type deleted	NOTIFY
168	Current Config saved to flash	NOTIFY
169	Error in saving config file to flash	ERR
170	Error in retrieving config information	ERR
171	Config File successfully configured system	NOTIFY
172	Error in initializing system with config file	ERR
198	A device tried to access another device that was not in the same zone	NOTIFY
199	Health timer has expired on Zone #	NOTIFY
208	Port # is over threshold	NOTIFY
218	Trunk DOWN on Port #	NOTIFY
219	Trunk UP on Port #	NOTIFY
220	New Primary Trunk	NOTIFY



## Appendix B. Default Smart Setting attributes

Table 34. Default Smart Setting attributes

	Initiator or Target	Initiator with Stealth	Target with Stealth	Fabric Connection	Tree Cascade	String Cascade --Trunk 1	String Cascade --Trunk 2	String Cascade --Trunk 3	String Cascade --Trunk 4	IBM Smart Setting	IBM Linux Initiator	IBM Linux Stealth Initiator
<b>Cascade Type</b>	nonCas-cade	nonCas-cade	nonCas-cade	tree	tree	string0	string1	string2	string3	nonCas-cade	nonCas-cade	nonCas-cade
<b>Control</b>	auto	auto	auto	auto	auto	auto	auto	auto	auto	auto	auto	auto
<b>Transmitter</b>	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled
<b>LIP on Insert Policy</b>	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled
<b>LIP on Removal Policy</b>	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled
<b>Device Test Before Insert Policy</b>	enabled	enabled	enabled	disabled	disabled	disabled	disabled	disabled	disabled	enabled	disabled	disabled
<b>LIP (F8) Recover Policy</b>	disabled	enabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
<b>SEOC Policy</b>	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
<b>Smart Insertion Policy</b>	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled
<b>Clear on Stall Policy</b>	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled
<b>Bypass on No Comma Policy</b>	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled	enabled
<b>LIP Control</b>	rxtlip	rxlip	txlip	rxtlip	nolip	nolip	nolip	nolip	nolip	rxtlip	rxtlip	rxlip
<b>Bypass on OS Error Policy</b>	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
<b>Bypass on CRC Error Policy</b>	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
<b>Bypass on Clock Delta Policy</b>	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled



## Appendix C. AL\_PA cross references

Arbitrated Loop Physical Addresses								
AL_PA	AL_PA ID		AL_PA	AL_PA ID		AL_PA	AL_PA ID	
(hex)	(hex)	(decimal)	(hex)	(hex)	(decimal)	(hex)	(hex)	(decimal)
EF	00	0	A3	2B	43	4D	56	86
E8	01	1	9F	2C	44	4C	57	87
E4	02	2	9E	2D	45	4B	58	88
E2	03	3	9D	2E	46	4A	59	89
E1	04	4	9B	2F	47	49	5A	90
E0	05	5	98	30	48	47	5B	91
DC	06	6	97	31	49	46	5C	92
DA	07	7	90	32	50	45	5D	93
D9	08	8	8F	33	51	43	5E	94
D6	09	9	88	34	52	3C	5F	95
D5	0A	10	84	35	53	3A	60	96
D4	0B	11	82	36	54	39	61	97
D3	0C	12	81	37	55	36	62	98
D2	0D	13	80	38	56	35	63	99
D1	0E	14	7C	39	57	34	64	100
CE	0F	15	7A	3A	58	33	65	101
CD	10	16	79	3B	59	32	66	102
CC	11	17	76	3C	60	31	67	103
CB	12	18	75	3D	61	2E	68	104
CA	13	19	74	3E	62	2D	69	105
C9	14	20	73	3F	63	2C	6A	106
C7	15	21	72	40	64	2B	6B	107
C6	16	22	71	41	65	2A	6C	108
C5	17	23	6E	42	66	29	6D	109
C3	18	24	6D	43	67	27	6E	110
BC	19	25	6C	44	68	26	6F	111
BA	1A	26	6B	45	69	25	70	112
B9	1B	27	6A	46	70	23	71	113
B6	1C	28	69	47	71	1F	72	114
B5	1D	29	67	48	72	1E	73	115
B4	1E	30	66	49	73	1D	74	116
B3	1F	31	65	4A	74	1B	75	117
B2	20	32	63	4B	75	18	76	118
B1	21	33	5C	4C	76	17	77	119
AE	22	34	5A	4D	77	10	78	120
AD	23	35	59	4E	78	0F	79	121
AC	24	36	56	4F	79	08	7A	122
AB	25	37	55	50	80	04	7B	123
AA	26	38	54	51	81	02	7C	124
A9	27	39	53	52	82	01	7D	125
A7	28	40	52	53	83	00	7E	126
A6	29	41	51	54	84	---	7F	127
A5	2A	42	4E	55	85	---	---	---



# Glossary

Table 35. Glossary

<b>AL_PA or Arbitrated Loop Physical Address</b>	A one-byte value used to identify a port in an Arbitrated Loop topology. The value of the AL_PA corresponds to bits 7:0 of the 24-bit Native Address Identifier.
<b>Arbitration</b>	The process of selecting one respondent from a group requesting service at the same time.
<b>Close (CLS)</b>	An Arbitrated Loop protocol used to terminate a loop circuit.
<b>Current Fill Word</b>	The fill word that the Loop Port State Machine uses when a fill word is to be transmitted.
<b>Duplex Cable</b>	Two fibers in one cable suitable for duplex transmission.
<b>Fiber Optics</b>	Light transmission through optical fibers for communication or signaling.
<b>Fibre Channel</b>	Fibre Channel is a data transfer interface technology that maps several common transport protocols including IP and SCSI, allowing it to merge high-speed I/O and networking functionality in a single connectivity technology. Fibre channel is an open standard as defined by ANSI and OSI standards and operates over copper and fiber optic cabling at distances of up to 10 kilometers. It is unique in its support of multiple interoperable topologies including point-to-point, arbitrated-loop and switching and it offers several qualities of service for network optimization. With its large packet sizes, Fibre Channel is ideal for storage, video, graphic and mass data transfer applications.
<b>LED</b>	Light-emitting diode. A status indicator on a switch.
<b>Gb/s</b>	Gigabits per second.
<b>Node</b>	An entity with one or more N_Ports or NL_Ports.
<b>Open (OPN)</b>	An Arbitrated Loop protocol used to establish a loop circuit.
<b>Protocol</b>	A data transmission convention which may include timing, control, formatting, error detection with correction and data representation.
<b>SCSI</b>	Small computer system interface. Standard interface for storage modules.
<b>SFP</b>	Small form-factor pluggable transceiver. These transceivers are fully compliant with FC-PI and MSA standards and occupy less than half the board space of the existing GBIC products.
<b>Topology</b>	The logical and/or physical arrangement of stations on a network. Fibre Channel topologies include point-to-point, Arbitrated Loop, and switched fabric.
<b>Transceiver</b>	A device that converts one form of signaling to another for both transmission and reception. SFPs and GBICs are transceivers.



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