BLADEOS™ 6.5
Menu-Based CLI
Command Reference

RackSwitch™ G8000

BLADE
NETWORK TECHNOLOGIES

Contents

Preface

The *BLADEOS 6.5 Command Reference* describes how to configure and use the BLADEOS 6.5 software with your RackSwitch G8000 (G8000). This guide lists each command, together with the complete syntax and a functional description, using the BLADEOS Command Line Interface (CLI).

For documentation on installing the switches physically, see the *Installation Guide* for your RackSwitch G8000. For details about configuration and operation of your G8000, see the *BLADEOS 6.5 Application Guide*.

Who Should Use This Book

This book is intended for network installers and system administrators engaged in configuring and maintaining a network. The administrator should be familiar with Ethernet concepts, IP addressing, the IEEE 802.1D Spanning Tree Protocol, and SNMP configuration parameters.

How This Book Is Organized

Chapter 1, "The Command Line Interface," describes how to connect to the switch and access the information and configuration menus.

Chapter 2, "First-Time Configuration," describes how to use the Setup utility for initial switch configuration and how to change the system passwords.

Chapter 3, "Menu Basics," provides an overview of the menu system, including a menu map, global commands, and menu shortcuts.

Chapter 4, "The Information Menu," shows how to view switch configuration parameters.

Chapter 5, "The Statistics Menu," shows how to view switch performance statistics.

Chapter 6, "The Configuration Menu," shows how to configure switch system parameters, ports, VLANs, Spanning Tree Protocol, SNMP, Port Mirroring, IP Routing, Port Trunking, and more.

Chapter 7, "The Operations Menu," shows how to use commands which affect switch performance immediately, but do not alter permanent switch configurations (such as temporarily disabling ports). The menu describes how to activate or deactivate optional software features.

Chapter 8, "The Boot Options Menu," describes the use of the primary and alternate switch images, how to load a new software image, and how to reset the software to factory defaults.

Chapter 9, "The Maintenance Menu," shows how to generate and access a dump of critical switch state information, how to clear it, and how to clear part or all of the forwarding database.

Appendix A, "BLADEOS System Log Messages," shows a listing of syslog messages.

Appendix B, "BLADE OS SNMP Agent," lists the Management Interface Bases (MIBs) supported in the switch software.

"Index" includes pointers to the description of the key words used throughout the book.

Typographic Conventions

The following table describes the typographic styles used in this book.

Table 1 Typographic Conventions

Typeface or Symbol	Meaning
`plain fixed-width text`	This type is used for names of commands, files, and directories used within the text. For example:
	View the `readme.txt` file.
	It also depicts on-screen computer output and prompts.
`bold fixed-width text`	This bold type appears in command examples. It shows text that must be typed in exactly as shown. For example:
	`/info/sys/gen`
bold body text	This bold type indicates objects such as window names, dialog box names, and icons, as well as user interface objects such as buttons, and tabs.
italicized body text	This italicized type indicates book titles, special terms, or words to be emphasized.
block body text	Indicates objects such as window names, dialog box names, and icons, as well as user interface objects such as buttons and tabs.
angle brackets < >	Indicate a variable to enter based on the description inside the brackets. Do not type the brackets when entering the command.
	Example: If the command syntax is **ping** *<IP address>*
	you enter **`ping 192.32.10.12`**

Table 1 Typographic Conventions

Typeface or Symbol	Meaning
braces { }	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command.
	Example: If the command syntax is **/cfg/l2/vlan/vmap {add|rem}** *<1-127>*
	you enter: **/cfg/l2/vlan/vmap add 1**
	or **/cfg/l2/vlan/vmap rem 1**
brackets [ ]	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command.
	Example: If the command syntax is **/cfg/sys/dhcp [mgta|mgtb] enable**
	you enter **/cfg/sys/dhcp mgta enable**
	or **/cfg/sys/dhcp mgtb enable**
vertical line |	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command.
	Example: If the command syntax is **/cfg/l3/route/ecmphash [sip|dip]**
	you enter: **/cfg/l3/route/ecmphash [sip]**
	or **/cfg/l3/route/ecmphash dip**
	or **/cfg/l3/route/ecmphash sip dip**

How To Get Help

If you need help, service, or technical assistance, call BLADE Network Technologies Technical Support:

US toll free calls: 1-800-414-5268

International calls: 1-408-834-7871

You also can visit our web site at the following address:

`http://www.bladenetwork.net`

Click the **Support** tab.

The warranty card received with your product provides details for contacting a customer support representative. If you are unable to locate this information, please contact your reseller. Before you call, prepare the following information:

- Serial number of the switch unit

- Software release version number

- Brief description of the problem and the steps you have already taken

- Technical support dump information (`# show tech-support`)

CHAPTER 1
The Command Line Interface

Your RackSwitch G8000 is ready to perform basic switching functions right out of the box. Some of the more advanced features, however, require some administrative configuration before they can be used effectively.

The extensive BLADEOS switching software included in your switch provides a variety of options for accessing and configuring the switch:

- A built-in, text-based command line interface and menu system for access via a Telnet session or serial-port connection

- SNMP support for access through network management software such as IBM Director or HP OpenView

- BLADEOS Browser-Based Interface (BBI)

The command line interface is the most direct method for collecting switch information and performing switch configuration. Using a basic terminal, you are presented with a hierarchy of menus that enable you to view information and statistics about the switch, and to perform any necessary configuration.

This chapter explains how to access the Command Line Interface (CLI) for the switch.

Connecting to the Switch

You can access the command line interface in any one of the following ways:

- Using a Telnet connection over the network
- Using an SSH connection
- Using a serial connection via the serial port on the G8000

Connecting to the Switch via Telnet

A Telnet connection offers the convenience of accessing the switch from any workstation connected to the network. Telnet access provides the same options for user access and administrator access as those available through the console port.

To configure the switch for Telnet access, the switch must have an IP address. The switch can get its IP address in one of two ways:

- Dynamically, from a DHCP server on your network
- Manually, when you configure the switch IP address

Once you have configured the switch with an IP address and gateway, you can access the switch from any workstation connected to an interface port. Telnet access provides the same options for user and administrator access as those available through the console port.

By default, Telnet access is enabled. Use the following command to disable/enable Telnet access:

```
# /cfg/sys/access/tnet e|d
```

To establish a Telnet connection to the switch, you can run the Telnet program on your workstation and issue the Telnet command, followed by the switch IP address:

```
telnet  <switch IP address>
```

Connecting to the Switch via SSH

Although a remote network administrator can manage the configuration of a G8000 via Telnet, this method does not provide a secure connection. The SSH (Secure Shell) protocol enables you to securely log into another device over a network to execute commands remotely. As a secure alternative to using Telnet to manage switch configuration, SSH ensures that all data sent over the network is encrypted and secure.

The switch can do only one session of key/cipher generation at a time. Thus, a SSH/SCP client will not be able to login if the switch is doing key generation at that time. Similarly, the system will fail to do the key generation if a SSH/SCP client is logging in at that time.

The supported SSH encryption and authentication methods are listed below.

- Server Host Authentication: Client RSA-authenticates the switch in the beginning of every connection.
- Key Exchange: RSA
- Encryption: 3DES-CBC, DES
- User Authentication: Local password authentication, RADIUS, TACACS+

The following SSH clients have been tested:

- OpenSSH_5.1p1 Debian-3ubuntu1
- SecureCRT 5.0 (Van Dyke Technologies, Inc.)
- Putty beta 0.60

Note – The BLADEOS implementation of SSH supports both versions 1.5 and 2.0 and supports SSH client version 1.5 - 2.x.

Using SSH to Access the Switch

Once the IP parameters are configured and the SSH service is enabled on the G8000 (it is disabled by default), you can access the command line interface using an SSH connection.

To establish an SSH connection with the switch, run the SSH program on your workstation by issuing the SSH command, followed by the switch IP address:

```
>> # ssh <switch IP address>
```

If SecurID authentication is required, use the following command:

```
>> # ssh −1 ace <switch IP address>
```

You will then be prompted to enter your user name and password.

Accessing the Switch

To enable better switch management and user accountability, three levels or *classes* of user access have been implemented on the G8000. Levels of access to CLI, Web management functions, and screens increase as needed to perform various switch management tasks. Conceptually, access classes are defined as follows:

- User interaction with the switch is completely passive—nothing can be changed on the G8000. Users may display information that has no security or privacy implications, such as switch statistics and current operational state information.

- Operators can only effect temporary changes on the G8000. These changes will be lost when the switch is rebooted/reset. Operators have access to the switch management features used for daily switch operations. Because any changes an operator makes are undone by a reset of the switch, operators cannot severely impact switch operation.

■ Administrators are the only ones that may make permanent changes to the switch configuration—changes that are persistent across a reboot/reset of the switch. Administrators can access switch functions to configure and troubleshoot problems on the G8000. Because administrators can also make temporary (operator-level) changes as well, they must be aware of the interactions between temporary and permanent changes.

Access to switch functions is controlled through the use of unique surnames and passwords. Once you are connected to the switch via local Telnet, remote Telnet, or SSH, you are prompted to enter a password. The default user names/password for each access level are listed in the following table.

Note – It is recommended that you change default switch passwords after initial configuration and as regularly as required under your network security policies. For more information, see "Setting Passwords" on page 30.

Table 2   User Access Levels

User Account	Description and Tasks Performed	Password
User	The User has no direct responsibility for switch management. He or she can view all switch status information and statistics, but cannot make any configuration changes to the switch.	`user`
Operator	The Operator manages all functions of the switch. The Operator can reset ports.	`oper`
Administrator	The superuser Administrator has complete access to all menus, information, and configuration commands on the G8000, including the ability to change both the user and administrator passwords.	`admin`

Note – With the exception of the "admin" user, access to each user level can be disabled by setting the password to an empty value.

Setup vs. CLI

Once the administrator password is verified, you are given complete access to the switch. If the switch is still set to its factory default configuration, the system will ask whether you wish to run Setup (see Chapter 2, "First-Time Configuration"), a utility designed to help you through the first-time configuration process. If the switch has already been configured, the Main Menu of the CLI is displayed instead.

The following table shows the Main Menu with administrator privileges.

```
[Main Menu]
     info   - Information Menu
     stats  - Statistics Menu
     cfg    - Configuration Menu
     oper   - Operations Command Menu
     boot   - Boot Options Menu
     maint  - Maintenance Menu
     diff   - Show pending config changes  [global command]
     apply  - Apply pending config changes [global command]
     save   - Save updated config to FLASH [global command]
     revert - Revert pending or applied changes [global command]
     exit   - Exit  [global command, always available]
```

Note – If you are accessing a user account, some menu options will not be available.

Command Line History and Editing

For a description of global commands, shortcuts, and command line editing functions, see "Menu Basics" on page 35."

Idle Timeout

By default, the switch will disconnect your Telnet session after 10 minutes of inactivity. This function is controlled by the idle timeout parameter, which can be set from 1 to 60 minutes. For information on changing this parameter, see "System Configuration Menu" on page 223.

CHAPTER 2
First-Time Configuration

To help with the initial process of configuring your switch, the BLADEOS software includes a Setup utility. The Setup utility prompts you step-by-step to enter all the necessary information for basic configuration of the switch. This chapter describes how to use the Setup utility and how to change system passwords. Before you run Setup, you must first connect to the switch (see Chapter 1, "Connecting to the Switch").

Using the Setup Utility

Whenever you log in as the system administrator under the factory default configuration, you are asked whether you wish to run the Setup utility. Setup can also be activated manually from the command line interface any time after login.

Information Needed for Setup

Setup requests the following information:

- Basic system information
  - □ Date & time
  - □ Whether to use Spanning Tree Group or not
- Optional configuration for each port
  - □ Speed, duplex, flow control, and negotiation mode (as appropriate)
  - □ Whether to use VLAN tagging or not (as appropriate)
- Optional configuration for each VLAN
  - □ Name of VLAN
  - □ Which ports are included in the VLAN

- Optional configuration of IP parameters
  - □ IP address, subnet mask, and VLAN for each IP interface
  - □ IP addresses for default gateway
  - □ Destination, subnet mask, and gateway IP address for each IP static route
  - □ Whether IP forwarding is enabled or not
  - □ Whether the RIP supply is enabled or not

Starting Setup When You Log In

The Setup prompt appears automatically whenever you login as the system administrator under the factory default settings.

1. Connect to the switch.

   After connecting, the login prompt will appear as shown below.

   ```
   Enter Password:
   ```

2. Enter **admin** as the default administrator password.

   If the factory default configuration is detected, the system prompts:

   ```
   RackSwitch G8000
   18:44:05 Wed Jan 3, 2010

   The switch is booted with factory default configuration.
   To ease the configuration of the switch, a "Set Up" facility which
   will prompt you with those configuration items that are essential to
   the operation of the switch is provided.
   Would you like to run "Set Up" to configure the switch? [y/n]:
   ```

   Note – If the default admin login is unsuccessful, or if the administrator Main Menu appears instead, the system configuration has probably been changed from the factory default settings. If you are certain that you need to return the switch to its factory default settings, see "Selecting a Configuration Block" on page 478.

3. Enter **y** to begin the initial configuration of the switch, or n to bypass the Setup facility.

Stopping and Restarting Setup Manually

Stopping Setup

To abort the Setup utility, press <Ctrl-C> during any Setup question. When you abort Setup, the system will prompt:

```
Would you like to run from top again? [y/n]
```

Enter **n** to abort Setup, or **y** to restart the Setup program at the beginning.

Restarting Setup

You can restart the Setup utility manually at any time by entering the following command at the administrator prompt:

```
# /cfg/setup
```

After initial configuration is complete, it is recommended that you change the default passwords as shown in "Setting Passwords" on page 30.

Optional Setup for Telnet Support

Note – This step is optional. Perform this procedure only if you are planning on connecting to the G8000 through a remote Telnet connection.

1. Telnet is enabled by default. To change the setting, use the following command:

```
>> # /cfg/sys/access/tnet
```

2. Apply and save the configuration(s).

```
>> System# apply
>> System# save
```

Setting Passwords

It is recommended that you change the user and administrator passwords after initial configuration and as regularly as required under your network security policies.

To change the administrator password, you must login using the administrator password.

Note – If you forget your administrator password, call your technical support representative for help using the password fix-up mode.

Changing the Default Administrator Password

The administrator has complete access to all menus, information, and configuration commands, including the ability to change both the user and administrator passwords.

The default password for the administrator account is admin. To change the default password, follow this procedure:

1. Connect to the switch and log in using the admin password.

2. From the Main Menu, use the following command to access the Configuration Menu:

```
Main# /cfg
```

The Configuration Menu is displayed.

```
[Configuration Menu]
     sys       - System-wide Parameter Menu
     port      - Port Menu
     stack     - Stacking Menu
     qos       - QOS Menu
     acl       - Access Control List Menu
     pmirr     - Port Mirroring Menu
     l2        - Layer 2 Menu
     l3        - Layer 3 Menu
     rmon      - RMON Menu
     virt      - Virtualization Menu
     setup     - Step by step configuration set up
     dump      - Dump current configuration to script file
     ptcfg     - Backup current configuration to FTP/TFTP server
     gtcfg     - Restore current configuration from FTP/TFTP server
     cur       - Display current configuration
```

3. From the Configuration Menu, use the following command to select the System Menu:

```
>> Configuration# sys
```

The System Menu is displayed.

```
[System Menu]
     errdis   - Errdisable Menu
     syslog   - Syslog Menu
     sshd     - SSH Server Menu
     radius   - RADIUS Authentication Menu
     tacacs+  - TACACS+ Authentication Menu
     ldap     - LDAP Authentication Menu
     ntp      - NTP Server Menu
     ssnmp    - System SNMP Menu
     access   - System Access Menu
     dst      - Custom DST Menu
     sflow    - sFlow Menu
     srvports - Server ports Menu
     date     - Set system date
     time     - Set system time
     timezone - Set system timezone
     dlight   - Set system daylight savings
     idle     - Set timeout for idle CLI sessions
     linkscan - Set linkscan mode
     notice   - Set login notice
     bannr    - Set login banner
     hprompt  - Enable/disable display hostname (sysName) in CLI prompt
     dhcp     - Enable/disable use of DHCP on interface 1
     reminder - Enable/disable Reminders
     rstctrl  - Enable/disable System reset on panic
     pktlog   - Enable/disable CPU packet logging capability
     cur      - Display current system-wide parameters
```

4. From the System Menu, use the following command to select the System Access Menu:

```
>> System# access
```

The System Access Menu is displayed.

```
[System Access Menu]
     mgmt     - Management Network Definition Menu
     user     - User Access Control Menu (passwords)
     https    - HTTPS Web Access Menu
     snmp     - Set SNMP access control
     tnport   - Set Telnet server port number
     tport    - Set the TFTP Port for the system
     wport    - Set HTTP (Web) server port number
     http     - Enable/disable HTTP (Web) access
     tnet     - Enable/disable Telnet access
     tsbbi    - Enable/disable Telnet/SSH configuration from BBI
     userbbi  - Enable/disable user configuration from BBI
     cur      - Display current system access configuration
```

5. Select the administrator password.

```
System Access# user/admpw
```

6. Enter the current administrator password at the prompt:

```
Changing ADMINISTRATOR password; validation required...
Enter current administrator password:
```

Note – If you forget your administrator password, call your technical support representative for help using the password fix-up mode.

7. Enter the new administrator password at the prompt:

```
Enter new administrator password:
```

8. Enter the new administrator password, again, at the prompt:

```
Re-enter new administrator password:
```

9. Apply and save your change by entering the following commands:

```
System# apply
System# save
```

Changing the Default User Password

The user login has limited control of the switch. Through a user account, you can view switch information and statistics, but you can't make configuration changes.

The default password for the user account is user. This password can be changed from the user account. The administrator can change all passwords, as shown in the following procedure.

1. Connect to the switch and log in using the admin password.

2. From the Main Menu, use the following command to access the Configuration Menu:

```
Main# cfg
```

3. From the Configuration Menu, use the following command to select the System Menu:

```
>> Configuration# sys
```

4. From the System Menu, use the following command to select the System Access Menu:

```
>> System# access
```

5. Select the user password.

```
System# user/usrpw
```

6. Enter the current administrator password at the prompt.

    Only the administrator can change the user password. Entering the administrator password confirms your authority.

```
Changing USER password; validation required...
Enter current administrator password:
```

7. Enter the new user password at the prompt:

```
Enter new user password:
```

8. Enter the new user password, again, at the prompt:

```
Re-enter new user password:
```

9. Apply and save your changes:

```
System# apply
System# save
```

CHAPTER 3
Menu Basics

The RackSwitch G8000 Command Line Interface (CLI) is used for viewing switch information and statistics. In addition, the administrator can use the CLI for performing all levels of switch configuration.

To make the CLI easy to use, the various commands have been logically grouped into a series of menus and sub-menus. Each menu displays a list of commands and/or sub-menus that are available, along with a summary of what each command will do. Below each menu is a prompt where you can enter any command appropriate to the current menu.

This chapter describes the Main Menu commands, and provides a list of commands and shortcuts that are commonly available from all the menus within the CLI.

The Main Menu

The Main Menu appears after a successful connection and login. The following table shows the Main Menu for the administrator login. Some features are not available under the user login.

```
[Main Menu]
      info    - Information Menu
      stats   - Statistics Menu
      cfg     - Configuration Menu
      oper    - Operations Command Menu
      boot    - Boot Options Menu
      maint   - Maintenance Menu
      diff    - Show pending config changes  [global command]
      apply   - Apply pending config changes [global command]
      save    - Save updated config to FLASH [global command]
      revert  - Revert pending or applied changes [global command]
      exit    - Exit  [global command, always available]
```

Menu Summary

■ **Information Menu**

Provides sub-menus for displaying information about the current status of the switch: from basic system settings to VLANs, and more.

■ **Statistics Menu**

Provides sub-menus for displaying switch performance statistics. Included are port, IF, IP, ICMP, TCP, UDP, SNMP, routing, ARP, DNS, and VRRP statistics.

■ **Configuration Menu**

This menu is available only from an administrator login. It includes sub-menus for configuring every aspect of the switch. Changes to configuration are not active until explicitly applied. Changes can be saved to non-volatile memory.

■ **Operations Menu**

Operations-level commands are used for making immediate and temporary changes to switch configuration. This menu is used for bringing ports temporarily in and out of service, enabling or disabling FDB learning on a port, or sending NTP requests. It is also used for activating or deactivating optional software packages.

■ **Boot Options Menu**

This menu is used for upgrading switch software, selecting configuration blocks, and for resetting the switch when necessary.

■ **Maintenance Menu**

This menu is used for debugging purposes, enabling you to generate a dump of the critical state information in the switch, and to clear entries in the forwarding database and the ARP and routing tables.

Global Commands

Some basic commands are recognized throughout the menu hierarchy. These commands are useful for obtaining online help, navigating through menus, and for applying and saving configuration changes.

For help on a specific command, type `help`. You will see the following screen:

```
Global Commands: [can be issued from any menu]
help            list            up              print
pwd             lines           verbose         exit
quit            config          diff            apply
save            revert          ping            traceroute
telnet          history         pushd           popd
who             chpass_p        chpass_s        clock

The following are used to navigate the menu structure:
    .   Print current menu
    ..  Move up one menu level
    /   Top menu if first, or command separator
    !   Execute command from history
```

Table 3 Description of Global Commands

Command	Action
? *command* **or help**	Provides more information about a specific command on the current menu. When used without the *command* parameter, a summary of the global commands is displayed.
. or **print**	Display the current menu.
list	Lists the commands available at the current level. You may follow the list command with a text string, and list all of the available commands that match the string.
.. or **up**	Go up one level in the menu structure.
/	If placed at the beginning of a command, go to the Main Menu. Otherwise, this is used to separate multiple commands placed on the same line.
lines [*n*]	Set the number of lines (*n*) that display on the screen at one time. The default is 24 lines. When used without a value, the current setting is displayed. Set lines to a value of 0 (zero) to disable pagination.
diff	Show any pending configuration changes.
apply	Apply pending configuration changes.

Table 3 Description of Global Commands

Command	Action
save	Write configuration changes to non-volatile flash memory.
revert	Remove pending configuration changes between "`apply`" commands. Use this command to remove any configuration changes made since last `apply`.
revert apply	Remove pending or applied configuration changes between "`save`" commands. Use this command to remove any configuration changes made since last `save`.
exit or **quit**	Exit from the command line interface and log out.
config	Displays the switch configuration dump.
ping	Use this command to verify station-to-station connectivity across the network. The format is as follows: **ping** *<host name>***|***<IP address>* **[-n** *<tries (0-4294967295)>***]** **[-w** *<msec delay (0-4294967295)>***]** **[-l** *<length (0/32-65500/2080)>***]** **[-s** *<IP source>***]** **[-v** *<tos (0-255)>***]** **[-f]** **[-t]** Where: □ **-n**: Sets the number of attempts (optional). □ **-w**: Sets the number of milliseconds between attempts (optional). □ **-l**: Sets the ping request payload size (optional). □ **-s**: Sets the IP source address for the IP packet (optional). □ **-v**: Sets the Type Of Service bits in the IP header. □ **-f**: Sets the *don't fragment* bit in the IP header (only for IPv4 addresses). □ **-t:** Pings continuously (same as **-n 0**). The DNS parameters must be configured if specifying hostnames (see "Domain Name System Configuration" on page 404).

Table 3 Description of Global Commands

Command	Action
traceroute	Use this command to identify the route used for station-to-station connectivity across the network. The format is as follows:
	traceroute *<hostname>***|***<IP address>* **[***<max-hops (1-32)>* [*<msec-delay (1-4294967295)>*]**]**
	Where *hostname/IP address* is the hostname or IP address of the target station, *max-hops* (optional) is the maximum distance to trace (1-32 devices), and *msec-delay* (optional) is the number of milliseconds to wait for the response.
	As with ping, the DNS parameters must be configured if specifying hostnames.
pwd	Display the command path used to reach the current menu.
verbose *n*	Sets the level of information displayed on the screen:
	0 = Quiet: Nothing appears except errors—not even prompts.
	1 = Normal: Prompts and requested output are shown, but no menus.
	2 = Verbose: Everything is shown.
	When used without a value, the current setting is displayed.
telnet	This command is used to telnet out of the switch. The format is as follows:
	telnet *<hostname>*|*<IP address>* [*<port>*]
	Where *IP address* is the hostname or IP address of the device.
history	This command displays the most recent commands.
pushd	Save the current menu path, so you can jump back to it using popd.
popd	Go to the menu path and position previously saved by using pushd.
who	Displays a list of users that are logged on to the switch.
chpass_p	Configures the password for the primary TACACS+ server.
chpass_s	Configures the password for the secondary TACACS+ server.
clock	Displays the configured date and time for the switch.

Command Line History and Editing

Using the command line interface, you can retrieve and modify previously entered commands with just a few keystrokes. The following options are available globally at the command line:

Table 4   Command Line History and Editing Options

Option	Description
history	Display a numbered list of the last 64 previously entered commands.
!!	Repeat the last entered command.
!n	Repeat the nth command shown on the history list.
<Ctrl-p>	(Also the up arrow key.) Recall the *previous* command from the history list. This can be used multiple times to work backward through the last 64 commands. The recalled command can be entered as is, or edited using the options below.
<Ctrl-n>	(Also the down arrow key.) Recall the *next* command from the history list. This can be used multiple times to work forward through the last 64 commands. The recalled command can be entered as is, or edited using the options below.
<Ctrl-a>	Move the cursor to the beginning of command line.
<Ctrl-e>	Move cursor to the *end* of the command line.
<Ctrl-b>	(Also the left arrow key.) Move the cursor *back* one position to the left.
<Ctrl-f>	(Also the right arrow key.) Move the cursor *forward* one position to the right.
<Backspace>	(Also the Delete key.) Erase one character to the left of the cursor position.
<Ctrl-d>	*Delete* one character at the cursor position.
<Ctrl-k>	*Kill* (erase) all characters from the cursor position to the end of the command line.
<Ctrl-l>	Redraw the screen.
<Ctrl-u>	Clear the entire line.
Other keys	Insert new characters at the cursor position.

Command Line Interface Shortcuts

The following shortcuts allow you to enter commands quickly and easily.

CLI List and Range Inputs

For CLI commands that allow an individual item to be selected from within a numeric range, lists and ranges of items can now be specified. For example, the `/info/vlan` command permits the following options:

```
#  /info/l2/vlan                          (show all VLANs)
#  /info/l2/vlan 1                        (show only VLAN 1)
#  /info/l2/vlan 1,3,4094                 (show listed VLANs)
#  /info/l2/vlan 1-20                     (show range 1 through 20)
#  /info/l2/vlan 1-5,90-99,4090-4094      (show multiple ranges)
#  /info/l2/vlan 1-5,19,20,4090-4094      (show a mix of lists and ranges)
```

The numbers in a range must be separated by a dash: *<start of range>*-*<end of range>*

Multiple ranges or list items are permitted using a comma: *<range or item 1>*,*<range or item 2>*

Do not use spaces within list and range specifications.

Ranges can also be used to apply the same command option to multiple items. For example, to enable multiple ports with one command:

```
#  /cfg/port 1-4/ena                      (Enable ports 1 though 4)
```

Command Stacking

As a shortcut, you can type multiple commands on a single line, separated by forward slashes (**/**). You can connect as many commands as required to access the menu option that you want. For example, the keyboard shortcut to access the Spanning Tree Port Configuration Menu from the `Main#` prompt is as follows:

```
Main#  cfg/l2/stg 1/port
```

Command Abbreviation

Most commands can be abbreviated by entering the first characters which distinguish the command from the others in the same menu or sub-menu. For example, the command shown above could also be entered as follows:

```
Main# c/l2/stg 1/po
```

Tab Completion

By entering the first letter of a command at any menu prompt and hitting <Tab>, the CLI will display all commands or options in that menu that begin with that letter. Entering additional letters will further refine the list of commands or options displayed. If only one command fits the input text when <Tab> is pressed, that command will be supplied on the command line, waiting to be entered. If the <Tab> key is pressed without any input on the command line, the currently active menu will be displayed.

CHAPTER 4
The Information Menu

You can view configuration information for the switch in both the user and administrator command modes. This chapter discusses how to use the command line interface to display switch information.

/info
Information Menu

```
[Information Menu]
    sys     - System Information Menu
    stack   - Stacking Menu
    l2      - Layer 2 Information Menu
    l3      - Layer 3 Information Menu
    qos     - QoS Menu
    acl     - Show ACL information
    rmon    - Show RMON information
    link    - Show link status
    port    - Show port information
    transcvr - Show Port Transceiver status
    virt    - Show Virtualization information
    dump    - Dump all information
```

The information provided by each menu option is briefly described in Table 5, with pointers to detailed information.

Table 5 Information Menu Options

Command Syntax and Usage

sys

Displays the System Information menu. For details, see page 46.

stack

Displays the Stacking Information Menu. For details, see page 61.

Table 5 Information Menu Options

Command Syntax and Usage

l2

Displays the Layer 2 Information menu. For details, see .

l3

Displays the Layer 3 Information menu. For details, see .

qos

Displays the Quality of Service (QoS) Information menu. For details, see .

acl

Displays the current configuration profile for each Access Control List (ACL) and ACL Group. For details, see .

rmon

Displays the Remote Monitoring (RMON) Information Menu. For details, see .

link

Displays configuration information about each port, including:

☐ Port alias and number
☐ Port speed
☐ Duplex mode (half, full, or auto)
☐ Flow control for transmit and receive (no, yes, or both)
☐ Link status (up, down, or disabled)

For details, see .

port

Displays port status information, including:

☐ Port alias and number
☐ Whether the port uses VLAN Tagging or not
☐ Port VLAN ID (PVID)
☐ Port name
☐ VLAN membership
☐ Fast Fowarding status
☐ FDB Learning status
☐ Flood Blocking status

For details, see .

Table 5   Information Menu Options

Command Syntax and Usage
transcvr Displays the status of the port transceiver module on each uplink port. For details, see page 136.
virt Displays the Virtualization information menu. For details, see page 137.
dump Dumps all switch information available from the Information menu (10K or more, depending on your configuration). If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

System Information Menu

```
[System Menu]
     errdis   - Errdisable Menu
     snmpv3   - SNMPv3 Information Menu
     srvports - Server ports information
     general  - Show general system information
     log      - Show syslog messages
     user     - Show current user status
     dump     - Dump all system information
```

The information provided by each menu option is briefly described in Table 6, with pointers to where detailed information can be found.

Table 6   System Information Options

Command Syntax and Usage

errdis

Displays Error Disable and Recovery Information menu. To view the menu options, see page 48.

snmpv3

Displays SNMPv3 Information menu. To view the menu options, see page 49.

srvports

Displays a list of configured server ports.

Table 6 System Information Options

Command Syntax and Usage

general

Displays system information, including:

- □ System date and time
- □ Switch model name and number
- □ Switch name and location
- □ Time of last boot
- □ MAC address of the switch management processor
- □ IP address of management interface
- □ Hardware version and part number
- □ Software image file and version number
- □ Configuration name
- □ Log-in banner, if one is configured

For details, see page 59.

log

Displays most recent syslog messages. For details, see page 60.

user

Displays configured user names and their status. For details, see page 61.

dump

Dumps all switch information available from the Information menu (10K or more, depending on your configuration).

/info/sys/errdis
Error Disable and Recovery Information

```
[ErrDisable Information Menu]
     recovery - Show ErrDisable recovery information
     timers   - Show ErrDisable timer information
     dump     - Show all of the above
```

This menu allows you to display information about the Error Disable and Recovery feature for interface ports.

Table 7 Error Disable Information Options

Command Syntax and Usage

recovery

Displays a list ports with their Error Recovery status.

timers

Displays a list of active recovery timers, if applicable.

dump

Displays all Error Disable and Recovery information.

`/info/sys/snmpv3`
SNMPv3 System Information

SNMP version 3 (SNMPv3) is an extensible SNMP Framework that supplements the SNMPv2 Framework by supporting the following:

- a new SNMP message format

- security for messages

- access control

- remote configuration of SNMP parameters

For more details on the SNMPv3 architecture please refer to RFC2271 to RFC2276.

```
[SNMPv3 Information Menu]
    usm      - Show usmUser table information
    view     - Show vacmViewTreeFamily table information
    access   - Show vacmAccess table information
    group    - Show vacmSecurityToGroup table information
    comm     - Show community table information
    taddr    - Show targetAddr table information
    tparam   - Show targetParams table information
    notify   - Show notify table information
    dump     - Show all SNMPv3 information
```

Table 8   SNMPv3 information Options

Command Syntax and Usage

`usm`

Displays User Security Model (USM) table information. To view the table, see page 51.

`view`

Displays information about view, sub-trees, mask and type of view. To view a sample, see page 52.

`access`

Displays View-based Access Control information. To view a sample, see page 53.

`group`

Displays information about the group that includes, the security model, user name, and group name. To view a sample, see page 54.

`comm`

Displays information about the community table information. To view a sample, see page 54.

Table 8   SNMPv3 information Options

Command Syntax and Usage

taddr

Displays the Target Address table information. To view a sample, see page 55.

tparam

Displays the Target parameters table information. To view a sample, see page 56.

notify

Displays the Notify table information. To view a sample, see page 57.

dump

Displays all the SNMPv3 information. To view a sample, see page 58.

`/info/sys/snmpv3/usm`
SNMPv3 USM User Table Information

The User-based Security Model (USM) in SNMPv3 provides security services such as authentication and privacy of messages. This security model makes use of a defined set of user identities displayed in the USM user table. The USM user table contains the following information:

- the user name

- a security name in the form of a string whose format is independent of the Security Model

- an authentication protocol, which is an indication that the messages sent on behalf of the user can be authenticated

- the privacy protocol

```
usmUser Table:
User Name                        Protocol
-------------------------------- --------------------------------
adminmd5                         HMAC_MD5, DES PRIVACY
adminsha                         HMAC_SHA, DES PRIVACY
v1v2only                         NO AUTH,  NO PRIVACY
```

Table 9 USM User Table Information

Field	Description
User Name	This is a string that represents the name of the user that you can use to access the switch.
Protocol	This indicates whether messages sent on behalf of this user are protected from disclosure using a privacy protocol. BLADEOS supports DES algorithm for privacy. The software also supports two authentication algorithms: MD5 and HMAC-SHA.

/info/sys/snmpv3/view
SNMPv3 View Table Information

The user can control and restrict the access allowed to a group to only a subset of the management information in the management domain that the group can access within each context by specifying the group's rights in terms of a particular MIB view for security reasons.

```
View Name           Subtree            Mask            Type
-----------------   ------------------  --------------  --------
iso                 1.3                                 included
v1v2only            1.3                                 included
v1v2only            1.3.6.1.6.3.15                      excluded
v1v2only            1.3.6.1.6.3.16                      excluded
v1v2only            1.3.6.1.6.3.18                      excluded
```

Table 10 SNMPv3 View Table Information

Field	Description
View Name	Displays the name of the view.
Subtree	Displays the MIB subtree as an OID string. A view subtree is the set of all MIB object instances which have a common Object Identifier prefix to their names.
Mask	Displays the bit mask.
Type	Displays whether a family of view subtrees is included or excluded from the MIB view.

`/info/sys/snmpv3/access`
SNMPv3 Access Table Information

The access control sub system provides authorization services.

The vacmAccessTable maps a group name, security information, a context, and a message type, which could be the read or write type of operation or notification into a MIB view.

The View-based Access Control Model defines a set of services that an application can use for checking access rights of a group. This group's access rights are determined by a read-view, a write-view and a notify-view. The read-view represents the set of object instances authorized for the group while reading the objects. The write-view represents the set of object instances authorized for the group when writing objects. The notify-view represents the set of object instances authorized for the group when sending a notification.

```
Group Name Model   Level        ReadV      WriteV     NotifyV
---------- ------- ------------ ---------- ---------- ----------
v1v2grp    snmpv1  noAuthNoPriv iso        iso        v1v2only
admingrp   usm     authPriv     iso        iso        iso
```

Table 11 SNMPv3 Access Table Information

Field	Description
Group Name	Displays the name of group.
Model	Displays the security model used, for example, SNMPv1, or SNMPv2 or USM.
Level	Displays the minimum level of security required to gain rights of access. For example, noAuthNoPriv, authNoPriv, or authPriv.
ReadV	Displays the MIB view to which this entry authorizes the read access.
WriteV	Displays the MIB view to which this entry authorizes the write access.
NotifyV	Displays the Notify view to which this entry authorizes the notify access.

/info/sys/snmpv3/group
SNMPv3 Group Table Information

A group is a combination of security model and security name that defines the access rights assigned to all the security names belonging to that group. The group is identified by a group name.

```
Sec Model     User Name                        Group Name
----------    ------------------------------   --------------------
snmpv1        v1v2only                         v1v2grp
usm           adminmd5                         admingrp
usm           adminsha                         admingrp
```

Table 12 SNMPv3 Group Table Information

Field	Description
Sec Model	Displays the security model used, which is any one of: USM, SNMPv1, SNMPv2, and SNMPv3.
User Name	Displays the name for the group.
Group Name	Displays the access name of the group.

/info/sys/snmpv3/comm
SNMPv3 Community Table Information

This command displays the community table information stored in the SNMP engine.

```
Index       Name        User Name            Tag
---------   ----------  --------------------  ----------
trap1       public      v1v2only             v1v2trap
```

Table 13 SNMPv3 Community Table Information

Field	Description
Index	Displays the unique index value of a row in this table
Name	Displays the community string, which represents the configuration.
User Name	Displays the User Security Model (USM) user name.
Tag	Displays the community tag. This tag specifies a set of transport endpoints from which a command responder application accepts management requests and to which a command responder application sends an SNMP trap.

`/info/sys/snmpv3/taddr`
SNMPv3 Target Address Table Information

This command displays the SNMPv3 target address table information, which is stored in the SNMP engine.

```
Name         Transport Addr   Port Taglist     Params
----------   --------------   ---- ----------  ---------------
trap1        47.81.25.66      162  v1v2trap    v1v2param
```

Table 14 SNMPv3 Target Address Table Information

Field	Description
Name	Displays the locally arbitrary, but unique identifier associated with this `snmpTargetAddrEntry`.
Transport Addr	Displays the transport addresses.
Port	Displays the SNMP UDP port number.
Taglist	This column contains a list of tag values which are used to select target addresses for a particular SNMP message.
Params	The value of this object identifies an entry in the `snmpTargetParamsTable`. The identified entry contains SNMP parameters to be used when generating messages to be sent to this transport address.

/info/sys/snmpv3/tparam
SNMPv3 Target Parameters Table Information

```
Name            MP Model   User Name         Sec Model  Sec Level
--------------- --------   --------------    ---------  ---------
v1v2param       snmpv2c    v1v2only          snmpv1     noAuthNoPriv
```

Table 15 SNMPv3 Target Table Information

Field	Description
Name	Displays the locally arbitrary, but unique identifier associated with this `snmpTargeParamsEntry`.
MP Model	Displays the Message Processing Model used when generating SNMP messages using this entry.
User Name	Displays the `securityName`, which identifies the entry on whose behalf SNMP messages will be generated using this entry.
Sec Model	Displays the security model used when generating SNMP messages using this entry. The system may choose to return an `inconsistentValue` error if an attempt is made to set this variable to a value for a security model which the system does not support.
Sec Level	Displays the level of security used when generating SNMP messages using this entry.

`/info/sys/snmpv3/notify`
SNMPv3 Notify Table Information

```
Name                 Tag
-------------------- --------------------
v1v2trap             v1v2trap
```

Table 16 SNMPv3 Notify Table Information

Field	Description
Name	The locally arbitrary, but unique identifier associated with this `snmpNotifyEntry`.
Tag	This represents a single tag value which is used to select entries in the `snmpTargetAddrTable`. Any entry in the `snmpTargetAddrTable` that contains a tag value equal to the value of this entry, is selected. If this entry contains a value of zero length, no entries are selected.

/info/sys/snmpv3/dump
SNMPv3 Dump Information

```
usmUser Table:
User Name                           Protocol
------------------------------  --------------------------------
adminmd5                            HMAC_MD5, DES PRIVACY
adminsha                            HMAC_SHA, DES PRIVACY
v1v2only                            NO AUTH,  NO PRIVACY

vacmAccess Table:
Group Name Model   Level         ReadV      WriteV     NotifyV
---------- ------- ------------  ---------- ---------- ----------
v1v2grp    snmpv1  noAuthNoPriv  iso        iso        v1v2only
admingrp   usm     authPriv      iso        iso        iso

vacmViewTreeFamily Table:
View Name               Subtree          Mask         Type
-------------------- ---------------  -----------   --------------
iso                     1.3                          included
v1v2only                1.3                          included
v1v2only                1.3.6.1.6.3.15               excluded
v1v2only                1.3.6.1.6.3.16               excluded
v1v2only                1.3.6.1.6.3.18               excluded

vacmSecurityToGroup Table:
Sec Model  User Name                         Group Name
---------- --------------------------------  -----------------------
snmpv1     v1v2only                          v1v2grp
usm        adminmd5                          admingrp
usm        adminsha                          admingrp

snmpCommunity Table:
Index      Name       User Name           Tag
---------- ---------- ------------------- ----------

snmpNotify Table:
Name                 Tag
-------------------- --------------------

snmpTargetAddr Table:
Name       Transport Addr  Port Taglist   Params
---------- --------------- ---- ---------- ---------------

snmpTargetParams Table:
Name                 MP Model User Name           Sec Model Sec Level
-------------------- -------- ------------------  --------- -------
```

/info/sys/general
General System Information

```
System Information at 0:16:42 Wed Jan 3, 2010
Time zone: America/US/Pacific
Daylight Savings Time Status: Disabled


RackSwitch G8000


Switch has been up for 0 days, 1 hour, 5 minutes and 4 seconds.
Last boot: 13:59:34 Wed Feb 22, 2000 (reset from console)

MAC address: 00:13:0a:4f:7e:30    IP (If 1) address: 127.31.36.139
Revision: 255
Switch Serial No: ************
Spare Part No: ************
Manufacturing date: **/**
Software Version 6.5.0 (FLASH image1), active configuration.


Fans are in Forward AirFlow, Warning at 55 C and Recover at 80 C

Temperature Sensor 1: 38.0 C
Temperature Sensor 2: 42.0 C
Temperature Sensor 3: --.-
Temperature Sensor 4: --.-

Speed of Fan 1:   16216 RPM
Speed of Fan 2:   16875 RPM
Speed of Fan 3:   16564 RPM
Speed of Fan 4:   16119 RPM
Speed of Fan 5:   16875 RPM

State of Power Supply 1:   Off
State of Power Supply 2:   On
```

Note – The display of temperature will come up only if the temperature of any of the sensors exceeds the temperature threshold. There will be a warning from the software if any of the sensors exceeds this temperature threshold. The switch will shut down if the power supply overheats.

System information includes:

- ■ System date and time
- ■ Switch model
- ■ Switch name and location
- ■ Time of last boot
- ■ MAC address of the switch management processor
- ■ Software image file and version number, and configuration name.

- IP address of the management interface
- Hardware version and part number
- Log-in banner, if one is configured

/info/sys/log
Show Recent Syslog Messages

```
Date     Time        Criticality level      Message
Jul  8  17:25:41     NOTICE      system: link up on port 1
Jul  8  17:25:41     NOTICE      system: link up on port 8
Jul  8  17:25:41     NOTICE      system: link up on port 7
Jul  8  17:25:41     NOTICE      system: link up on port 2
Jul  8  17:25:41     NOTICE      system: link up on port 1
Jul  8  17:25:41     NOTICE      system: link up on port 4
Jul  8  17:25:41     NOTICE      system: link up on port 3
Jul  8  17:25:41     NOTICE      system: link up on port 6
Jul  8  17:25:41     NOTICE      system: link up on port 5
Jul  8  17:25:41     NOTICE      system: link up on port 4
Jul  8  17:25:41     NOTICE      system: link up on port 1
Jul  8  17:25:41     NOTICE      system: link up on port 3
Jul  8  17:25:41     NOTICE      system: link up on port 2
Jul  8  17:25:41     NOTICE      system: link up on port 3
Jul  8  17:25:42     NOTICE      system: link up on port 2
Jul  8  17:25:42     NOTICE      system: link up on port 4
Jul  8  17:25:42     NOTICE      system: link up on port 3
Jul  8  17:25:42     NOTICE      system: link up on port 6
Jul  8  17:25:42     NOTICE      system: link up on port 5
Jul  8  17:25:42     NOTICE      system: link up on port 1
Jul  8  17:25:42     NOTICE      system: link up on port 6
```

Each syslog message has a criticality level associated with it, included in text form as a prefix to the log message. One of eight different prefixes is used, depending on the condition that the administrator is being notified of, as shown below.

- EMERG: indicates the system is unusable

- ALERT: Indicates action should be taken immediately

- CRIT: Indicates critical conditions

- ERR: indicates error conditions or errored operations

- WARNING: indicates warning conditions

- NOTICE: indicates a normal but significant condition

- INFO: indicates an information message

- DEBUG: indicates a debug-level message

/info/sys/user
User Status Information

```
Usernames:
  user     - enabled - offline
  oper     - disabled - offline
  admin    - Always Enabled - online 1 session
Current User ID table:
  1: name paul   , dis, cos user    , password valid, offline
Current strong password settings:
  strong password status: disabled
```

This command displays the status of the configured usernames.

/info/stack
Stacking Information Menu

```
[Stacking Menu]
    switch   - Show switch information
    link     - Show stack link information
    name     - Show stack name
    backup   - Show backup unit number
    vers     - Show switch firmware information
    path     - Show inter switch packet path map
    pushstat - Show config/image push status information
    dump     - Dump all stacking information
```

Table 17 lists the Stacking information menu options.

Table 17   Stacking information Menu Options (/info/stack)

Command Syntax and Usage

switch

Displays information about each switch in the stack, including:

- □ Configured Switch Number (csnum)
- □ Assigned Switch Number (asnum)
- □ MAC address
- □ Stacking state

link

Displays link information for each switch in the stack, listed by assigned switch number.

Table 17 Stacking information Menu Options (/info/stack)

Command Syntax and Usage

name

Displays the name of the stack.

backup

Displays the unit number of the backup switch.

vers

Displays the firmware version number for the selected switch.

path

Displays the Stacking packet path map that shows how the stack switches are connected.

pushstat

Displays the status of the most recent firmware and configuration file push from the master to member switches.

dump

Displays all stacking information.

/info/stack/switch
Stacking Switch Information

```
Stack name: MyStack
Local switch is the master.

Local switch:
   csnum            - 1
   MAC              - 00:25:03:1c:96:00
   Switch Type      - 9
   Switch Mode (cfg) - Master
   Priority         - 225
   Stack MAC        - 00:25:03:1c:96:1f

Master switch:
   csnum            - 1
   MAC              - 00:25:03:1c:96:00

Backup switch:
   csnum            - 2
   MAC              - 00:ef:61:79:00:00

Configured Switches:
-------------------------------------
csnum            MAC          asnum
-------------------------------------
 C1     00:25:03:1c:96:00     A1
 C2     00:ef:61:79:00:00     A2

Attached Switches in Stack:
-----------------------------------------------
asnum            MAC          csnum  State
-----------------------------------------------
 A1     00:25:03:1c:96:00      C1    IN_STACK
 A2     00:ef:61:79:00:00      C2    IN_STACK
```

Stack switch information includes the following:

- Stack name

- Details about the local switch from which the command was issued

- Configured switch number and MAC of the Stack Master and Stack Backup

- Configured switch numbers and their associated assigned switch numbers

- Assigned switch numbers and their associated configured switch numbers

/info/l2
Layer 2 Information Menu

```
[Layer 2 Menu]
     amp     - Active Multipath Information Menu
     fdb     - Forwarding Database Information Menu
     lacp    - Link Aggregation Control Protocol Menu
     failovr - Show Failover information
     hotlink - Show Hot Links information
     lldp    - LLDP Information Menu
     udld    - UDLD Information Menu
     oam     - OAM Information Menu
     8021x   - Show 802.1X information
     stp     - Show STP information
     cist    - Show CIST information
     trunk   - Show Trunk Group information
     vlan    - Show VLAN information
     pvlan   - Show protocol VLAN information
     prvlan  - Show private-vlan information
     dump    - Dump all layer 2 information
```

The information provided by each menu option is briefly described in Table 18, with pointers to where detailed information can be found.

Table 18   Layer 2 Information Options

Command Syntax and Usage

amp

Displays the Active MultiPath (AMP) Information menu. For details, see page 67.

fdb

Displays the Forwarding Database Information menu. For details, see page 70.

lacp

Displays the Link Aggregation Control Protocol menu. For details, see page 72.

failovr

Displays the Layer 2 Failover Information menu. For details, see page 74.

hotlink

Displays the Hot Links Information menu. For details, see page 75.

lldp

Displays the LLDP Information menu. For details, see page 76.

Table 18 Layer 2 Information Options

Command Syntax and Usage

udld

Displays the Unidirectional Link Detection (UDLD) Information menu. For details, see page 78.

oam

Displays the Operation, Administration, and Maintenance (OAM) Information menu. For details, see page 79.

8021x

Displays the 802.1X Information menu. For details, see page 80.

stp

Displays Spanning Tree information, including the status (on or off), Spanning Tree mode (STP/PVST+, RSTP, PVRST, or MSTP), and VLAN membership.

In addition to seeing if STG is enabled or disabled, you can view the following STG bridge information:

☐ Priority

☐ Hello interval

☐ Maximum age value

☐ Forwarding delay

☐ Aging time

You can also see the following port-specific STG information:

☐ Port alias and priority

☐ Cost

☐ State

☐ Port Fast Forwarding state

For details, see page 82.

Table 18   Layer 2 Information Options

Command Syntax and Usage

cist

Displays Common Internal Spanning Tree (CIST) information, including the MSTP digest and VLAN membership.

CIST bridge information includes:

- □   Priority
- □   Hello interval
- □   Maximum age value
- □   Forwarding delay
- □   Root bridge information (priority, MAC address, path cost, root port)

CIST port information includes:

- □   Port number and priority
- □   Cost
- □   State

For details, see .

trunk

When trunk groups are configured, you can view the state of each port in the various trunk groups. For details, see .

vlan

Displays VLAN configuration information, including:

- □   VLAN Number
- □   VLAN Name
- □   Status
- □   Port membership of the VLAN

For details, see .

pvlan

Displays Protocol VLAN information.

Table 18   Layer 2 Information Options

Command Syntax and Usage

prvlan

Displays Private VLAN information.

dump

Dumps all switch information available from the Layer 2 menu (10K or more, depending on your configuration).

If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

/info/l2/amp
Active MultiPath Information

```
[AMP Information Menu]
     global   - Show global AMP information
     group    - Show AMP group information
```

Use these commands to display Active MultiPath Protocol (AMP) information for the switch.

Table 19   AMP Information Options

Command Syntax and Usage

global

Displays global Active MultiPath (AMP) information.

group

Displays AMP group information.

`/info/l2/amp/global`
Show AMP Global Information

```
Active Multipath Protocol: enabled
       Protocol version  : 2
       Switch id         : 00:22:00:ee:cd:00
       Switch type       : aggregator
       Switch priority   : 100
       Packet interval   : 50 centiseconds
       Timeout count     : 4
       Aggr. precedence   : 1
       Aggr. link        : Trunk 2 (Ports 12 13)
       No. of groups     : 3

Group  State  Ports
-----  -----  -----
1       up    Trunk 1
2       up    Trunk 13 [LACP 100]
3       up    21

Port   State  Trunk
-----  -----  -----
1       fwd   1
2       fwd   1
12      fwd   2
13      fwd   2
17      fwd   13
18      fwd   13
21      fwd
```

This displays show global AMP information for an AMP aggregator switch. AMP global information includes the following:

■ Active MultiPath Protocol information:

    □ AMP status (enabled or disabled)

    □ Protocol version

    □ Switch ID (MAC address)

    □ Switch type (access or aggregator)

    □ Priority

    □ Interval between AMP keep-alive packets

    □ Timeout count

    □ Aggregator precedence (1 or 2)

    □ Aggregator links

    □ Number of active (enabled) AMP groups

- Group information
  - □ Group number
  - □ Group state (up or DOWN)
  - □ Ports/portchannels in the group
- Link information
  - □ Port number
  - □ State (fwd, BLOCK, or DOWN)
  - □ Portchannel (trunk) number

/info/l2/amp/group *<AMP group number>*
Show AMP Group Information

```
Group 3: enabled, topology UP
        Port  10: access
                State : forwarding
                Peer  : 00:22:00:ac:d7:00
                        aggregator, priority 100
        Port  11: access
                State : forwarding
                Peer  : 00:25:03:49:82:00
                        aggregator, priority 1
```

This display shows AMP group information for an AMP access switch. AMP group information includes the following:

- AMP group number and topology status (UP or DOWN)
- AMP link 1:
  - □ Switch type (access/aggregator)
  - □ State (forwarding, BLOCKING, or DOWN)
  - □ Peer information (MAC address, switch type, AMP priority)
- AMP link 2:
  - □ Switch type (access/aggregator)
  - □ State (forwarding, BLOCKING, or DOWN)
  - □ Peer information (MAC address, switch type, AMP priority)

/info/l2/fdb
FDB Information

```
[Forwarding Database Menu]
      find     - Show a single FDB entry by MAC address
      port     - Show FDB entries on a single port
      vlan     - Show FDB entries on a single VLAN
      state    - Show FDB entries by state
      mcdump   - Show FDB multicast entries
      static   - Show FDB static entries
      dump     - Show all FDB entries
```

The forwarding database (FDB) contains information that maps the media access control (MAC) address of each known device to the switch port where the device address was learned. The FDB also shows which other ports have seen frames destined for a particular MAC address.

Note – The master forwarding database supports up to 16K MAC address entries on the MP per switch.

Table 20   FDB Information Options

Command Syntax and Usage

find *<MAC address>* [*<VLAN>*]

Displays a single database entry by its MAC address. You are prompted to enter the MAC address of the device. Enter the MAC address using the format, xx:xx:xx:xx:xx:xx. For example, 08:00:20:12:34:56

You can also enter the MAC address using the format, xxxxxxxxxxxx. For example, 080020123456

port *<port number or alias>*

Displays all FDB entries for a particular port.

trunk *<trunk number>*

Displays all FDB entries for a particular trunk.

vlan *<VLAN number>*

Displays all FDB entries on a single VLAN.

state unknown|forward|trunk

Displays all FDB entries of a particular state.

Table 20 FDB Information Options

Command Syntax and Usage

mcdump

> Displays all Multicast MAC entries in the FDB.

static

> Displays all static MAC entries in the FDB.

dump

> Displays all entries in the Forwarding Database. For more information, see page 71.

/info/l2/fdb/dump
Show All FDB Information

```
    MAC address      VLAN  Port  Trnk  State  Permanent
    -----------------  ----  ----  ----  -----  ---------
    00:04:38:90:54:18    1   4            FWD
    00:09:6b:9b:01:5f    1   13           FWD
    00:09:6b:ca:26:ef    2   1            FWD
    00:0f:06:ec:3b:00    2   1            FWD
    00:11:43:c4:79:83    1   4            FWD       P
```

An address that is in the forwarding (FWD) state, means that it has been learned by the switch. When in the trunking (TRK) state, the port field represents the trunk group number. If the state for the port is listed as unknown (UNK), the MAC address has not yet been learned by the switch, but has only been seen as a destination address.

When an address is in the unknown state, no outbound port is indicated, although ports which reference the address as a destination will be listed under "Reference ports."

Clearing Entries from the Forwarding Database

To clear the entire FDB, refer to "Forwarding Database Maintenance" on page 486.

/info/l2/lacp
Link Aggregation Control Protocol Information

```
[LACP Menu]
     aggr     - Show LACP aggregator information
     port     - Show LACP port information
     dump     - Show all LACP ports information
```

Use these commands to display Link Aggregation Protocol (LACP) status information about each port on the switch.

Table 21   LACP Information Options

Command Syntax and Usage

aggr *<port alias or number>*

Displays detailed information about the LACP aggregator.

port

Displays LACP information about the selected port.

dump

Displays a summary of LACP information. For details, see page 73.

/info/l2/lacp/dump
Show All LACP Information

```
port    mode      adminkey  operkey  selected   prio  aggr  trunk  status
--------------------------------------------------------------------------
1       active        30       30      yes      32768   17    19     up
2       active        30       30      yes      32768   17    19     up
3       off            3        3      no       32768   --    --     --
4       off            4        4      no       32768   --    --     --
...
```

LACP dump includes the following information for each port in the G8000:

- ◼ mode   Displays the port's LACP mode (active, passive, or off).

- ◼ adminkey   Displays the value of the port's *adminkey*.

- ◼ operkey   Shows the value of the port's operational key.

- ◼ selected   Indicates whether the port has been selected to be part of a Link Aggregation Group.

- ◼ prio   Shows the value of the port priority.

- ◼ aggr   Displays the aggregator associated with each port.

- ◼ trunk   This value represents the LACP trunk group number.

- ◼ status   Displays the status of LACP on the port (up or down).

/info/l2/failovr
Layer 2 Failover Information

```
[Failover Info Menu]
    trigger  - Show Trigger information
```

Table 22 describes the Layer 2 Failover information options.

Table 22   Layer 2 Failover Information Options

Command Syntax and Usage

---

trigger *<trigger number>*

Displays detailed information about the selected Layer 2 Failover trigger.

/info/l2/failovr/trigger *<trigger number>*
Show Layer 2 Failover Information

```
Trigger 1 Manual Monitor: Enabled
Trigger 1 limit: 0
Monitor State: Up
Member      Status
---------   -----------
trunk 1
 2          Operational
 3          Operational

Control State: Auto Controlled
Member      Status
---------   -----------
 1          Operational
 2          Operational
 3          Operational
...
```

A monitor port's Failover status is Operational only if all the following conditions hold true:

- Port link is up.
- If Spanning Tree is enabled, the port is in the Forwarding state.
- If the port is a member of an LACP trunk group, the port is aggregated.

If any of the above conditions are not true, the monitor port is considered to be failed.

A control port is considered to be operational if the monitor trigger state is Up. Even if a port's link status is Down, Spanning-Tree status is Blocking, and the LACP status is Not Aggregated, from a teaming perspective the port status is Operational, since the trigger is Up.

A control port's status is displayed as Failed only if the monitor trigger state is Down.

/info/l2/hotlink
Hot Links Information

```
[Hot Links Info Menu]
     trigger  - Show Trigger information
```

Table 23 Hot Links Information Options

Command Syntax and Usage

trigger

Displays status and configuration information for each Hot Links trigger.
To view a sample display, see .

/info/l2/hotlink/trigger
Hotlinks Trigger Information

```
Hot Links Info: Trigger

Current global Hot Links setting: ON
bpdu disabled
sndfdb disabled

Current Trigger 1 setting: enabled
name "Trigger 1", preempt enabled, fdelay 1 sec


Active state: None


Master settings:
port 1
Backup settings:
port 2
```

Hot Links trigger information includes the following:

- Hot Links status (on or off)
- Status of BPDU flood option
- Status of FDB send option
- Status and configuration of each Hot Links trigger

/info/l2/lldp
LLDP Information

```
[LLDP Information Menu]
     port    - Show LLDP port information
     rx      - Show LLDP receive state machine information
     tx      - Show LLDP transmit state machine information
     remodev - Show LLDP remote devices information
     dump    - Show all LLDP information
```

Table 24   LLDP Information Options

Command Syntax and Usage

port *<port alias or number>*

Displays Link Layer Discovery Protocol (LLDP) port information.

rx

Displays information about the LLDP receive state machine.

tx

Displays information about the LLDP transmit state machine.

remodev

Displays information received from LLDP -capable devices. To view a sample display, see page 77.

dump

Displays all LLDP information.

/info/l2/lldp/remodev
LLDP Remote Device Information

```
LLDP Remote Devices Information

LocalPort | Index | Remote Chassis ID | RemotePort | Remote System Name
----------|-------|-------------------|------------|--------------------------
        2 | 210   | 00 16 ca ff 7e 00 | 15         | BNT Gb Ethernet Switch...
        4 | 12    | 00 16 60 f9 3b 00 | 20         | BNT Gb Ethernet Switch...
```

LLDP remote device information provides a summary of information about remote devices
connected to the switch. To view detailed information about a device, as shown below, follow the
remodev command with the index number of the remote device.

```
Local Port Alias: 1
        Remote Device Index    : 15
        Remote Device TTL      : 99
        Remote Device RxChanges : false
        Chassis Type           : Mac Address
        Chassis Id             : 00-18-b1-33-1d-00
        Port Type              : Locally Assigned
        Port Id                : 23
        Port Description       : 23

        System Name       :
        System Description :

        System Capabilities Supported : bridge, router
        System Capabilities Enabled   : bridge, router

        Remote Management Address:
                Subtype           : IPv4
                Address           : 10.100.120.181
                Interface Subtype : ifIndex
                Interface Number  : 128
                Object Identifier :
```

/info/l2/udld
Unidirectional Link Detection Information

```
[UDLD Information Menu]
    port    - Show UDLD port information
    dump    - Show all UDLD information
```

Table 25 UDLD Information Options

Command Syntax and Usage

port *<port alias or number>*

Displays UDLD information about the selected port. To view a sample display, see .

dump

Displays all UDLD information.

/info/l2/udld/port *<port alias or number>*
UDLD Port Information

```
UDLD information on port 1
Port enable administrative configuration setting: Enabled
Port administrative mode: normal
Port enable operational state: link up
Port operational state: advertisement
Port bidirectional status: bidirectional
Message interval: 15
Time out interval: 5
Neighbor cache: 1 neighbor detected

  Entry #1
  Expiration time: 31 seconds
  Device Name:
  Device ID: 00:da:c0:00:04:00
  Port ID: 1
```

UDLD information includes the following:

- Status (enabled or disabled)

- Mode (normal or aggressive)

- Port state (link up or link down)

- Bi-directional status (unknown, unidirectional, bidirectional, TX-RX loop, neighbor mismatch)

/info/l2/oam
OAM Discovery Information

```
[OAM Information Menu]
     port    - Show OAM port information
     dump    - Show all OAM information
```

Table 26 OAM Discovery Information Options

Command Syntax and Usage

port *<port alias or number>*

Displays OAM information about the selected port. To view a sample display, see page 79.

dump

Displays all OAM information.

/info/l2/oam/port *<port alias or number>*
OAM Port Information

```
OAM information on port 1
State enabled
Mode active
Link up
Satisfied Yes
Evaluating No

Remote port information:
Mode active
MAC address 00:da:c0:00:04:00
Stable Yes
State valid Yes
Evaluating No
```

OAM port display shows information about the selected port and the peer to which the link is connected.

/info/l2/8021x
802.1X Information

```
System capability : Authenticator
System status     : disabled
Protocol version  : 1
Guest VLAN status : disabled
Guest VLAN        : none
                                  Authenticator   Backend
Port    Auth Mode    Auth Status   PAE State    Auth State
-----   -----------  -----------   -------------- ----------
*1      force-auth   unauthorized  initialize   initialize
 2      force-auth   unauthorized  initialize   initialize
*3      force-auth   unauthorized  initialize   initialize
*4      force-auth   unauthorized  initialize   initialize
*5      force-auth   unauthorized  initialize   initialize
*6      force-auth   unauthorized  initialize   initialize
*7      force-auth   unauthorized  initialize   initialize
*8      force-auth   unauthorized  initialize   initialize
*9      force-auth   unauthorized  initialize   initialize
*10     force-auth   unauthorized  initialize   initialize
*11     force-auth   unauthorized  initialize   initialize
*12     force-auth   unauthorized  initialize   initialize
*13     force-auth   unauthorized  initialize   initialize
*14     force-auth   unauthorized  initialize   initialize
*15     force-auth   unauthorized  initialize   initialize
*16     force-auth   unauthorized  initialize   initialize
*17     force-auth   unauthorized  initialize   initialize
*18     force-auth   unauthorized  initialize   initialize
*19     force-auth   unauthorized  initialize   initialize
*20     force-auth   unauthorized  initialize   initialize
...
------------------------------------------------------------------
* - Port down or disabled
```

The following table describes the IEEE 802.1X parameters.

Table 27 802.1X Parameter Descriptions

Parameter	Description
Port	Displays each port's alias.
Auth Mode	Displays the Access Control authorization mode for the port. The Authorization mode can be one of the following: ■ force-unauth ■ auto ■ force-auth

Table 27   802.1X Parameter Descriptions

Parameter	Description
Auth Status	Displays the current authorization status of the port, either authorized or unauthorized.
Authenticator PAE State	Displays the Authenticator Port Access Entity State. The PAE state can be one of the following: ■ `initialize` ■ `disconnected` ■ `connecting` ■ `authenticating` ■ `authenticated` ■ `aborting` ■ `held` ■ `forceAuth`
Backend Auth State	Displays the Backend Authorization State. The Backend Authorization state can be one of the following: ■ `initialize` ■ `request` ■ `response` ■ `success` ■ `fail` ■ `timeout` ■ `idle`

/info/l2/stp
Spanning Tree Information

```
-------------------------------------------------------------------
upfast disabled, update 40
Pvst+ compatibility mode enabled
-------------------------------------------------------------------
Spanning Tree Group 1: On (STP/PVST+)
VLANs:  1

Current Root:            Path-Cost  Port Hello MaxAge FwdDel
 ffff 00:13:0a:4f:7d:d0    20015       26   2     20     15

Parameters:  Priority  Hello  MaxAge  FwdDel  Aging
              32768       2      20      15     300

Port  Priority   Cost   FastFwd   State       Designated Bridge     Des Port
----  --------   ----   --------  ----------  --------------------- ---------
2           0      0       n      FORWARDING  *
3           0      0       n      FORWARDING  *
4           0      0       n      FORWARDING  *
15        128      4!      n      BLOCKING     8000-00:22:00:ad:25:00    800f
16        128      4!      n      BLOCKING     8000-00:22:00:ad:25:00    8010
17        128      4!      n      BLOCKING     8000-00:22:00:ad:25:00    8011
26        128      4!      n      FORWARDING   8000-00:22:00:ad:25:00    8002
27        128      4!      n      BLOCKING     8000-00:22:00:ad:25:00    8003
28        128      4!      n      BLOCKING     8000-00:22:00:ad:25:00    8004
...
* = STP turned off for this port.
! = Automatic path cost.
```

The switch software uses the IEEE 802.1D Spanning Tree Protocol (STP). If IEEE 802.1w Rapid Spanning Tree Protocol (RSTP), the IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), or Per VLAN Rapid Spanning Tree Protocol (PVRST+) are turned on, see "RSTP/MSTP/PVRST Information" on page 85.

When STP is used, in addition to seeing if STG is enabled or disabled, you can view the following STG bridge information:

Table 28 Spanning Tree Parameter Descriptions

Parameter	Description
Current Root	The Current Root shows information about the root bridge for the Spanning Tree. Information includes the priority (in hexadecimal notation) and MAC address of the root.
Priority (bridge)	The bridge priority parameter controls which bridge on the network will become the STG root bridge.
Hello	The hello time parameter specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
MaxAge	The maximum age parameter specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigure the STG network.
FwdDel	The Forward Delay parameter specifies, in seconds, the amount of time that a bridge port has to wait before it changes from listening to learning and from learning state to forwarding state.
Aging	The aging time parameter specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.
Priority (port)	The port priority parameter helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
FastFwd	The FastFwd shows whether the port is in Fast Forwarding mode or not, which permits the port that participates in Spanning Tree to bypass the Listening and Learning states and enter directly into the Forwarding state.
State	The state field shows the current state of the port. The state field can be BLOCKING, LISTENING, LEARNING, FORWARDING, or DISABLED.

Table 28 Spanning Tree Parameter Descriptions (continued)

Parameter	Description
Designated Bridge	The Designated Bridge shows information about the bridge connected to each port, if applicable. Information includes the priority (in hexadecimal notation) and MAC address of the Designated Bridge.
Designated Port	The identifier of the port on the Designated Bridge to which this port is connected.

/info/l2/stp
RSTP/MSTP/PVRST Information

```
upfast disabled, update 40
Pvst+ compatibility mode enabled

------------------------------------------------------------------
Spanning Tree Group 1: On (RSTP)
VLANs:  1

Current Root:              Path-Cost  Port Hello MaxAge FwdDel
 0000 00:16:60:ba:6c:01     2026       26   2     20     15

Parameters:  Priority  Hello  MaxAge  FwdDel  Aging
             32768       2      20       15    300

Port  Priority   Cost   FastFwd   State        Designated Bridge      Des Port
----  --------   ----   --------  ----------   --------------------   --------
2            0      0       n      FORWARDING   *
3            0      0       n      FORWARDING   *
4            0      0       n      FORWARDING   *
15         128      4!      n      BLOCKING     8000-00:22:00:ad:25:00   800f
16         128      4!      n      BLOCKING     8000-00:22:00:ad:25:00   8010
17         128      4!      n      BLOCKING     8000-00:22:00:ad:25:00   8011
26         128      4!      n      FORWARDING   8000-00:22:00:ad:25:00   8002
27         128      4!      n      BLOCKING     8000-00:22:00:ad:25:00   8003
28         128      4!      n      BLOCKING     8000-00:22:00:ad:25:00   8004
...
* = STP turned off for this port.
! = Automatic path cost.
```

The switch software can be set to use the IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) or the IEEE 802.1s Multiple Spanning Tree Protocol (MSTP). If RSTP/MSTP is turned on (see), you can view RSTP/MSTP bridge information for the Spanning Tree Group and port-specific RSTP information.

The following table describes the STP parameters in RSTP or MSTP mode.

Table 29   RSTP/MSTP Parameter Descriptions

Parameter	Description
Current Root	The Current Root shows information about the root bridge for the Spanning Tree. Information includes the priority (in hexadecimal notation) and MAC address of the root.
Priority (bridge)	The bridge priority parameter controls which bridge on the network will become the STP root bridge.

Table 29 RSTP/MSTP Parameter Descriptions (continued)

Parameter	Description
Hello	The hello time parameter specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
MaxAge	The maximum age parameter specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network.
FwdDel	The Forward Delay parameter specifies, in seconds, the amount of time that a bridge port has to wait before it changes from listening to learning and from learning state to forwarding state.
Aging	The aging time parameter specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.
Prio (port)	The port priority parameter helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
State	The State field shows the current state of the port. The State field in RSTP or MSTP mode can be one of the following: Discarding (DISC), Learning (LRN), Forwarding (FWD), or Disabled (DSB).
Role	The Role field shows the current role of this port in the Spanning Tree. The port role can be one of the following: Designated (DESG), Root (ROOT), Alternate (ALTN), Backup (BKUP), Disabled (DSB), Master (MAST).
Designated Bridge	The Designated Bridge shows information about the bridge connected to each port, if applicable. Information includes the priority (in hexadecimal notation) and MAC address of the Designated Bridge.
Designated Port	The port ID of the port on the Designated Bridge to which this port is connected.
Type	Type of link connected to the port, and whether the port is an edge port. Link type values are AUTO, P2P, or SHARED.

`/info/l2/cist`
Common Internal Spanning Tree Information

```
Mstp Digest: 0xac36177f50283cd4b83821d8ab26de62
Common Internal Spanning Tree:

VLANs MAPPED:  1-4094
VLANs:  1

Current Root:            Path-Cost  Port MaxAge FwdDel
 8000 00:04:38:d2:ab:e1    40011     26    20     15

Cist Regional Root:       Path-Cost
 8000 00:22:00:ac:d4:00       0

Parameters:  Priority  MaxAge  FwdDel  Hops
              32768      20      15     20
Port  Prio  Cost     State Role Designated Bridge      Des Port Hello    Type
----- ---- -------- ----- ---- -------------------- -------- ----- ---------
2     128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   801a   2      P2P
3     128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   801b   2      P2P
4     128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   801c   2      P2P
15    128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   800f   2      P2P
16    128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   8010   2      P2P
17    128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   8011   2      P2P
26    128   20000!  FWD  ROOT 8000-00:22:00:ad:25:00   8002   2      P2P
27    128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   8003   2      P2P
28    128   20000!  DISC ALTN 8000-00:22:00:ad:25:00   8004   2      P2P
...
! = Automatic path cost.
```

In addition to seeing if Common Internal Spanning Tree (CIST) is enabled or disabled, you can view CIST bridge and port-specific information. The following table describes the CIST parameters.

Table 30 CIST Parameter Descriptions

Parameter	Description
CIST Root	The CIST Root shows information about the root bridge for the Common Internal Spanning Tree (CIST). Values on this row of information refer to the CIST root.
CIST Regional Root	The CIST Regional Root shows information about the root bridge for this MSTP region. Values on this row of information refer to the regional root.
Priority (bridge)	The bridge priority parameter controls which bridge on the network will become the STP root bridge.

Table 30 CIST Parameter Descriptions

Parameter	Description
Hello	The hello time parameter specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
MaxAge	The maximum age parameter specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigure the STP network.
FwdDel	The forward delay parameter specifies, in seconds, the amount of time that a bridge port has to wait before it changes from learning state to forwarding state.
Hops	The maximum number of bridge hops a packet can traverse before it is dropped. The default value is 20.
Priority (port)	The port priority parameter helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
State	The state field shows the current state of the port. The state field can be either Discarding (DISC), Learning (LRN), or Forwarding (FWD).
Role	The Role field shows the current role of this port in the Spanning Tree. The port role can be one of the following: Designated (DESG), Root (ROOT), Alternate (ALTN), Backup (BKUP), Disabled (DSB), Master (MAST), or Unknown (UNK).
Designated Bridge	The Designated Bridge shows information about the bridge connected to each port, if applicable. Information includes the priority (in hexadecimal notation) and MAC address of the Designated Bridge.
Designated Port	The port ID of the port on the Designated Bridge to which this port is connected.
Type	Type of link connected to the port, and whether the port is an edge port. Link type values are AUTO, P2P, or SHARED.

/info/l2/trunk
Trunk Group Information

```
Trunk group 1: Enabled
Protocol - Static
Port state:
  1: STG  1 forwarding
  2: STG  1 forwarding
```

When trunk groups are configured, you can view the state of each port in the various trunk groups.

Note – If Spanning Tree Protocol on any port in the trunk group is set to forwarding, the remaining ports in the trunk group will also be set to forwarding.

/info/l2/vlan
VLAN Information

```
VLAN               Name              Status          Ports
----  -------------------------------  ------  -----------------------
1     Default VLAN                     ena    1 4-19 21-29 31-39 41-XGE4
100   VLAN 100                          ena     2 3 20
200   VLAN 200                          ena     30
300   VLAN 300                          ena     40
1000  VLAN 1000                         ena     25 26

PVLAN   Protocol   FrameType   EtherType   Priority   Status      Ports
-----  --------  ------------------  --------  ------  ---------------
1000   5          LLC         ffff       4          ena       25

PVLAN      PVLAN-Tagged Ports
-----   ----------------------------
1000    25

Private-VLAN     Type      Mapped-To           Status      Ports
------------  ---------  ------------------  ----------  ---------------
100           primary    200 300             ena         2 3 20
200           community  100                 ena         30
300           isolated   100                 ena         40
```

This information display includes all configured VLANs and all member ports that have an active link state. Port membership is represented in slot/port format.

VLAN information includes:

- ◼ VLAN Number

- ◼ VLAN Name

- ◼ Status

- ◼ Port membership of the VLAN

- ◼ Protocol VLAN information (if available)

- ◼ Private VLAN information (if available)

/info/l3
Layer 3 Information Menu

```
[Layer 3 Menu]
     route    - IP Routing Information Menu
     arp      - ARP Information Menu
     bgp      - BGP Information Menu
     ospf     - OSPF Routing Information Menu
     ospf3    - OSPFv3 Routing Information Menu
     rip      - RIP Routing Information Menu
     route6   - IP6 Routing Information Menu
     nbrcache - IP6 Neighbor Cache Information Menu
     ndprefix - IP6 Neighbour Discovery Information
     ecmp     - Show ECMP static routes information
     hash     - Show ECMP hashing result
     igmp     - Show IGMP Snooping Multicast Group information
     vrrp     - Show Virtual Router Redundancy Protocol information
     if       - Show Interface information
     ip6pmtu  - Show IPv6 Path MTU information
     ip       - Show IP information
     dump     - Dump all layer 3 information
```

The information provided by each menu option is briefly described in Table 31, with pointers to detailed information.

Table 31   Layer 3 Information Options

Command Syntax and Usage

route

Displays the IP Routing menu. Using the options of this menu, the system displays the following for each configured or learned route:

☐   Route destination IP address, subnet mask, and gateway address

☐   Type of route

☐   Tag indicating origin of route

☐   Metric for RIP tagged routes, specifying the number of hops to the destination (1-15 hops, or 16 for infinite hops)

☐   The IP interface that the route uses

For details, see page 94.

arp

Displays the Address Resolution Protocol (ARP) Information menu. For details, see page 97.

Table 31 Layer 3 Information Options

Command Syntax and Usage

bgp

> Displays BGP Information menu. To view menu options, see page 99.

ospf

> Displays OSPF routing Information menu. For details, see page 101.

ospf3

> Displays OSPFv3 routing Information Menu. For details, see page 106.

rip

> Displays Routing Information Protocol menu. For details, see page 112.

route6

> Displays the IPv6 Routing Information menu. To view menu options, see page 113.

nbrcache

> Displays the IPv6 Neighbor Discovery Cache Information menu. To view menu options, see page 115.

ndprefix

> Displays the IPv6 Neighbor Discovery Prefix information menu. To view menu options, see page 116.

ecmp

> Displays ECMP static routes. For details, see page 116.

hash *<source IP> <destination IP> <ECMP paths>*

> Displays ECMP hashing information.

igmp

> Displays IGMP Information menu. For details, see page 119.

vrrp

> Displays VRRP Information. For details, see page 122.

if

> Displays interface information. For details, see page 117.

Table 31 Layer 3 Information Options

Command Syntax and Usage

ip6pmtu [<*destination IPv6 address*>**]**

Displays IPv6 Path MTU information. For details, see page 123.

ip

Displays IP Information. For details, see page 118.

 IP information, includes:

☐ IP interface information: Interface number, IP address, subnet mask, VLAN number, and operational status.

☐ Default gateway information: Metric for selecting which configured gateway to use, gateway number, IP address, and health status

☐ IP forwarding settings, network filter settings, route map settings

dump

Dumps all switch information available from the Layer 3 menu (10K or more, depending on your configuration).

If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

`/info/l3/route`
IP Routing Information

```
[IP Routing Menu]
     find    - Show a single route by destination IP address
     gw      - Show routes to a single gateway
     type    - Show routes of a single type
     tag     - Show routes of a single tag
     if      - Show routes on a single interface
     dump    - Show all routes
```

Using the commands listed below, you can display all or a portion of the IP routes currently held in the switch.

Table 32 Route Information Options

Command Syntax and Usage

find *<IP address (such as 192.4.17.101)>*

Displays a single route by destination IP address.

gw *<default gateway address (such as 192.4.17.44)>*

Displays routes to a single gateway.

type indirect|direct|local|broadcast|martian|multicast

Displays routes of a single type. For a description of IP routing types, see Table 33 on page 95.

tag fixed|static|addr|rip|ospf|bgp|broadcast|martian|multicast

Displays routes of a single tag. For a description of IP routing types, see Table 34 on page 96.

if *<interface number>*

Displays routes on a single interface.

dump

Displays all routes configured in the switch. For more information, see page 95.

/info/l3/route/dump
Show All IP Route Information

```
Status code: * - best
    Destination        Mask            Gateway          Type       Tag      Metr If
  --------------- --------------- --------------- --------- --------- ---- --
* 0.0.0.0         0.0.0.0         172.31.1.1       indirect  static         1
* 12.0.0.0        255.0.0.0       0.0.0.0          martian   martian
* 12.31.0.0       255.255.0.0     172.31.36.139    direct    fixed          1
* 12.31.36.139    255.255.255.255 172.31.36.139    local     addr           1
* 12.31.255.255   255.255.255.255 172.31.255.255   broadcast broadcast      1
* 224.0.0.0       224.0.0.0       0.0.0.0          martian   martian
* 224.0.0.0       240.0.0.0       0.0.0.0          multicast addr
* 255.255.255.255 255.255.255.255 255.255.255.255  broadcast broadcast
```

The following table describes the Type parameters.

Table 33 IP Routing Type Parameters

Parameter	Description
indirect	The next hop to the host or subnet destination will be forwarded through a router at the Gateway address.
direct	Packets will be delivered to a destination host or subnet attached to the switch.
local	Indicates a route to one of the switch's IP interfaces.
broadcast	Indicates a broadcast route.
martian	The destination belongs to a host or subnet which is filtered out. Packets to this destination are discarded.
multicast	Indicates a multicast route.

The following table describes the Tag parameters.

Table 34 IP Routing Tag Parameters

Parameter	Description
fixed	The address belongs to a host or subnet attached to the switch.
static	The address is a static route which has been configured on the G8000.
addr	The address belongs to one of the switch's IP interfaces.
rip	The address was learned by the Routing Information Protocol (RIP).
ospf	The address was learned by Open Shortest Path First (OSPF).
bgp	The address was learned via Border Gateway Protocol (BGP)
broadcast	Indicates a broadcast address.
martian	The address belongs to a filtered group.
multicast	Indicates a multicast address.

`/info/l3/arp`
ARP Information

```
[Address Resolution Protocol Menu]
      find    - Show a single ARP entry by IP address
      port    - Show ARP entries on a single port
      vlan    - Show ARP entries on a single VLAN
      addr    - Show ARP address list
      dump    - Show all ARP entries
```

The ARP information includes IP address and MAC address of each entry, address status flags (see Table 35 on page 97), VLAN and port for the address, and port referencing information.

Table 35   ARP Information Options

Command Syntax and Usage

`find` *<IP address (such as, 192.4.17.101>*

Displays a single ARP entry by IP address.

`port` *<port alias or number>*

Displays the ARP entries on a single port.

`vlan` *<VLAN number>*

Displays the ARP entries on a single VLAN.

`addr`

Displays the ARP address list: IP address, IP mask, MAC address, and VLAN flags.

`dump`

Displays all ARP entries. including:

- □ IP address and MAC address of each entry
- □ Address status flag (see below)
- □ The VLAN and port to which the address belongs
- □ The ports which have referenced the address (empty if no port has routed traffic to the IP address shown)

For more information, see page 98.

/info/l3/arp/addr
ARP Address List Information

```
Current ARP configuration:
 rearp 5

Current static ARP:
ip                mac                 interface
-------------     ----------------    ---------


IP Address        Flags      Hardware Address     Interface
-------------     ------     ----------------     ---------
127.20.1.1                   00:15:40:07:20:42    1
127.20.254.21     P          00:22:00:4d:b9:00    1
```

The Port field shows the target port of the ARP entry.

The Flag field is interpreted as follows:

Table 36 ARP Dump Flag Parameters

Flag	Description
P	Permanent entry created for switch IP interface.
R	Indirect route entry.
U	Unresolved ARP entry. The MAC address has not been learned.

/info/l3/arp/dump
Show All ARP Entry Information

```
   IP address      Flags     MAC address      VLAN  Age Port
 --------------- ----- ---------------- ---- --- ----
  172.31.1.1                00:16:60:bc:98:41    1    0 2
  172.31.35.1              00:18:71:73:48:5f    1  292 2
  172.31.36.139    P    00:13:0a:4f:7e:30    1
  172.31.37.252            00:08:5d:18:a7:68    1  487 2
```

/info/l3/bgp
BGP Information

```
[BGP Menu]
      peer    - Show all BGP peers
      summary - Show all BGP peers in summary
      dump    - Show BGP routing table
```

Table 37 BGP Peer Information Options

Command Syntax and Usage

peer

Displays BGP peer information. See page 99 for a sample output.

summary

Displays peer summary information such as AS, message received, message sent, up/down, state. See page 100 for a sample output.

dump

Displays the BGP routing table. See page 100 for a sample output.

/info/l3/bgp/peer
BGP Peer Information

Following is an example of the information that /info/l3/bgp/peer provides.

```
BGP Peer Information:

  3: 2.1.1.1          , version 4, TTL 225
    Remote AS: 100, Local AS: 100, Link type: IBGP
    Remote router ID: 3.3.3.3,    Local router ID: 1.1.201.5
    BGP status: idle, Old status: idle
    Total received packets: 0, Total sent packets: 0
    Received updates: 0, Sent updates: 0
    Keepalive: 60, Holdtime: 180, MinAdvTime: 60
    LastErrorCode: unknown(0), LastErrorSubcode: unspecified(0)
    Established state transitions: 1

  4: 2.1.1.4          , version 4, TTL 225
    Remote AS: 100, Local AS: 100, Link type: IBGP
    Remote router ID: 4.4.4.4,    Local router ID: 1.1.201.5
    BGP status: idle, Old status: idle
    Total received packets: 0, Total sent packets: 0
    Received updates: 0, Sent updates: 0
    Keepalive: 60, Holdtime: 180, MinAdvTime: 60
    LastErrorCode: unknown(0), LastErrorSubcode: unspecified(0)
    Established state transitions: 1
```

/info/l3/bgp/summary
BGP Summary Information

Following is an example of the information that /info/l3/bgp/summary provides.

```
 BGP Peer Summary Information:
       Peer          V    AS     MsgRcvd  MsgSent Up/Down   State
    --------------- - -------- -------- -------- -------- ----------
   1: 205.178.23.142  4      142      113      121 00:00:28 established
   2: 205.178.15.148  0      148        0        0 never     connect
```

/info/l3/bgp/dump
Show All BGP Information

Following is an example of the information that /info/l3/bgp/dump provides.

```
 >> BGP# dump
Status codes: * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
    Network         Mask            Next Hop        Metr LcPrf  Wght  Path
   --------------- --------------- --------------- ----- ----- ----- --------
*> 1.1.1.0         255.255.255.0   0.0.0.0                        0   ?
*> 10.100.100.0    255.255.255.0   0.0.0.0                        0   ?
*> 10.100.120.0    255.255.255.0   0.0.0.0                        0   ?

The 13.0.0.0 is filtered out by rrmap; or, a loop detected.
```

/info/l3/ospf
OSPF Information

```
[OSPF Information Menu]
     general - Show general information
     aindex  - Show area(s) information
     if      - Show interface(s) information
     virtual - Show details of virtual links
     nbr     - Show neighbor(s) information
     dbase   - Database Menu
     sumaddr - Show summary address list
     nsumadd - Show NSSA summary address list
     routes  - Show OSPF routes
     dump    - Show OSPF information
```

Table 38   OSPF Information Options

Command Syntax and Usage

general

Displays general OSPF information. See page 102 for a sample output.

aindex   *<area index (0-2)>*

Displays area information for a particular area index. If no parameter is supplied, it displays area information for all the areas.

if   *<interface number>*

Displays interface information for a particular interface. If no parameter is supplied, it displays information for all the interfaces. See page 103 for a sample output.

virtual

Displays information about all the configured virtual links.

nbr   *<nbr router-id (A.B.C.D)>*

Displays the status of a neighbor with a particular router ID. If no router ID is supplied, it displays the information about all the current neighbors.

dbase

Displays OSPF database menu. To view menu options, see page 103.

sumaddr   *<area index (0-2)>*

Displays the list of summary ranges belonging to non-NSSA areas.

Table 38 OSPF Information Options

Command Syntax and Usage

---

nsumadd *<area index (0-2)>*

Displays the list of summary ranges belonging to NSSA areas.

---

routes

Displays OSPF routing table. See page 105 for a sample output.

---

dump

Displays the OSPF information.

/info/l3/ospf/general
OSPF General Information

```
OSPF Version 2
Router ID: 10.10.10.1
Started at 1663 and the process uptime is 4626
Area Border Router: yes, AS Boundary Router: no
LS types supported are 6
External LSA count 0
External LSA checksum sum 0x0
Number of interfaces in this router is 2
Number of virtual links in this router is 1
16 new lsa received and 34 lsa originated from this router
Total number of entries in the LSDB 10
Database checksum sum 0x0
Total neighbors are 1, of which
                                2 are >=INIT state,
                                2 are >=EXCH state,
                                2 are =FULL state
Number of areas is 2, of which 3-transit 0-nssa
        Area Id : 0.0.0.0
        Authentication : none
        Import ASExtern : yes
        Number of times SPF ran : 8
        Area Border Router count : 2
        AS Boundary Router count : 0
        LSA count : 5
        LSA Checksum sum : 0x2237B
        Summary : noSummary
```

/info/l3/ospf/if *<interface number>*
OSPF Interface Information

```
Ip Address 10.10.12.1, Area 0.0.0.1, Admin Status UP
   Router ID 10.10.10.1, State DR, Priority 1
   Designated Router (ID) 10.10.10.1, Ip Address 10.10.12.1
   Backup Designated Router (ID) 10.10.14.1, Ip Address 10.10.12.2
   Timer intervals, Hello 10, Dead 40, Wait 1663, Retransmit 5,
   Neighbor count is 1   If Events 4, Authentication type none
```

/info/l3/ospf/dbase
OSPF Database Information

```
[OSPF Database Menu]
     advrtr  - LS Database info for an Advertising Router
     asbrsum - ASBR Summary LS Database info
     dbsumm  - LS Database summary
     ext     - External LS Database info
     nw      - Network LS Database info
     nssa    - NSSA External LS Database info
     rtr     - Router LS Database info
     self    - Self Originated LS Database info
     summ    - Network-Summary LS Database info
     all     - All
```

Table 39 OSPF Database Information Options

Command Syntax and Usage

advrtr *<router-id (A.B.C.D)>*

Takes advertising router as a parameter. Displays all the Link State Advertisements (LSAs) in the LS database that have the advertising router with the specified router ID, for example: 20.1.1.1.

asbrsum *<adv-rtr (A.B.C.D)> | <link_state_id (A.B.C.D> | <self>*

Displays ASBR summary LSAs. The usage of this command is as follows:

☐ asbrsum adv-rtr 20.1.1.1
   Displays ASBR summary LSAs having the advertising router 20.1.1.1.

☐ asbrsum link-state-id 10.1.1.1
   Displays ASBR summary LSAs having the link state ID 10.1.1.1.

☐ asbrsum self
   Displays the self advertised ASBR summary LSAs.

☐ asbrsum with no parameters displays all the ASBR summary LSAs.

Table 39 OSPF Database Information Options

Command Syntax and Usage

dbsumm

Displays the following information about the LS database in a table format:

☐   Number of LSAs of each type in each area.

☐   Total number of LSAs for each area.

☐   Total number of LSAs for each LSA type for all areas combined.

☐   Total number of LSAs for all LSA types for all areas combined.

No parameters are required.

ext *<adv-rtr (A.B.C.D)>|<link_state_id (A.B.C.D>|<self>*

Displays the AS-external (type 5) LSAs with detailed information of each field of the LSAs. The usage of this command is the same as the usage of the command `asbrsum`.

nw *<adv-rtr (A.B.C.D)>|<link_state_id (A.B.C.D>|<self>*

Displays the network (type 2) LSAs with detailed information of each field of the LSA.network LS database. The usage of this command is the same as the usage of the command `asbrsum`.

nssa *<adv-rtr (A.B.C.D)>|<link_state_id (A.B.C.D>|<self>*

Displays the NSSA (type 7) LSAs with detailed information of each field of the LSAs. The usage of this command is the same as the usage of the command `asbrsum`.

rtr *<adv-rtr (A.B.C.D)>|<link_state_id (A.B.C.D>|<self>*

Displays the router (type 1) LSAs with detailed information of each field of the LSAs. The usage of this command is the same as the usage of the command `asbrsum`.

self

Displays all the self-advertised LSAs. No parameters are required.

summ *<adv-rtr (A.B.C.D)>|<link_state_id (A.B.C.D>|<self>*

Displays the network summary (type 3) LSAs with detailed information of each field of the LSAs. The usage of this command is the same as the usage of the command `asbrsum`.

all

Displays all the LSAs.

/info/l3/ospf/routes
OSPF Route Codes Information

```
Codes: IA - OSPF inter area,
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
 IA 10.10.0.0/16 via 200.1.1.2
 IA 40.1.1.0/28 via 20.1.1.2
 IA 80.1.1.0/24 via 200.1.1.2
 IA 100.1.1.0/24 via 20.1.1.2
 IA 140.1.1.0/27 via 20.1.1.2
 IA 150.1.1.0/28 via 200.1.1.2
 E2 172.18.1.1/32 via 30.1.1.2
 E2 172.18.1.2/32 via 30.1.1.2
 E2 172.18.1.3/32 via 30.1.1.2
 E2 172.18.1.4/32 via 30.1.1.2
 E2 172.18.1.5/32 via 30.1.1.2
 E2 172.18.1.6/32 via 30.1.1.2
 E2 172.18.1.7/32 via 30.1.1.2
 E2 172.18.1.8/32 via 30.1.1.2
```

/info/l3/ospf3
OSPFv3 Information Menu

```
[OSPFv3 Information Menu]
     aindex   - Show area database information Menu
     dbase    - Database Menu
     areas    - Show areas information
     if       - Show interface(s) information
     virtual  - Show details of virtual links
     nbr      - Show neighbor(s) information
     host     - Show host information
     reqlist  - Show request list
     retlist  - Show retransmission list
     sumaddr  - Show summary address information
     redist   - Show config applied to routes learnt from RTM
     ranges   - Show OSPFv3 summary ranges
     routes   - Show OSPFv3 routes
     borderrt - Show OSPFv3 routes to an abr/asbr
     dump     - Show OSPFv3 information
```

Table 40   OSPFv3 Information Options

Command Syntax and Usage

aindex   *<area index (0-2)>*

Displays the area information menu for a particular area index. To view menu options, see page 108.

dbase

Displays the OSPFv3 database menu. To view menu options, see page 110.

areas

Displays the OSPFv3 Area Table.

if   *<interface number>*

Displays interface information for a particular interface. If no parameter is supplied, it displays information for all the interfaces. To view a sample display, see page 110.

virtual

Displays information about all the configured virtual links.

nbr   *<nbr router-id (A.B.C.D)>*

Displays the status of a neighbor with a particular router ID. If no router ID is supplied, it displays the information about all the current neighbors.

Table 40   OSPFv3 Information Options

Command Syntax and Usage

host

Displays OSPFv3 host configuration information.

reqlist *<nbr router-id (A.B.C.D)>*

Displays the OSPFv3 request list. If no router ID is supplied, it displays the information about all the current neighbors.

retlist *<nbr router-id (A.B.C.D)>*

Displays the OSPFv3 retransmission list. If no router ID is supplied, it displays the information about all the current neighbors.

sumaddr

Displays the OSPFv3 external summary-address configuration information.

redist

Displays OSPFv3 redistribution information to be applied to routes learned from the route table.

ranges

Displays the OSPFv3 list of all area address ranges information.

routes

Displays OSPFv3 routing table. To view a sample display, see .

borderrt

Displays OSPFv3 routes to an ABR or ASBR.

dump

Displays all OSPFv3 information. To view a sample display, see .

/info/l3/ospf3/aindex *<0-2>*
OSPFv3 Area Index Information Menu

```
[Area Info Menu]
     asext   - External LS Database info
     interprf - Inter Area Prefix LS Database info
     interrtr - Inter Area Router LS Database info
     intraprf - Intra Area Prefix LS Database info
     link    - Link LS Database info
     network - Network LS Database info
     rtr     - Router LS Database info
     nssa    - NSSA LS Database info
     all     - All
```

The following commands allow you to display database information about the specified area.

Table 41   OSPFv3 Area Index Information Options

Command Syntax and Usage

asext [detail|hex]

Displays AS-External LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

interprf [detail|hex]

Displays Inter-Area Prefix LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

interrtr [detail|hex]

Displays Inter-Area router LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

intraprf [detail|hex]

Displays Intra-Area Prefix LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

link [detail|hex]

Displays Link LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

network [detail|hex]

Displays Network LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

Table 41   OSPFv3 Area Index Information Options

Command Syntax and Usage

rtr [detail|hex]

Displays the Router LSAs with detailed information of each field of the LSAs. If no parameter is supplied, it displays condensed information.

nssa [detail|hex]

Displays NSSA database information for the selected area. If no parameter is supplied, it displays condensed information.

all [detail|hex]

Displays all the LSAs for the selected area. If no parameter is supplied, it displays condensed information.

/info/l3/ospf3/dump
OSPFv3 Information

```
Router Id: 1.0.0.1          ABR Type: Standard ABR
 SPF schedule delay: 5 secs  Hold time between two SPFs: 10 secs
 Exit Overflow Interval: 0   Ref BW: 100000      Ext Lsdb Limit: none
 Trace Value: 0x00008000    As Scope Lsa: 2      Checksum Sum: 0xfe16
 Passive Interface: Disable
 Nssa Asbr Default Route Translation: Disable
 Autonomous System Boundary Router
 Redistributing External Routes from connected, metric 10, metric type
 asExtType1, no tag set
 Number of Areas in this router  1
                        Area    0.0.0.0
    Number of interfaces in this area is 1
    Number of Area Scope Lsa: 7      Checksum Sum: 0x28512
    Number of Indication Lsa: 0     SPF algorithm executed: 2 times
```

`/info/l3/ospf3/if` *<interface number>*
OSPFv3 Interface Information

```
        Ospfv3 Interface Information

Interface Id: 1       Instance Id: 0       Area Id: 0.0.0.0
Local Address: fe80::222:ff:fe7d:5d00      Router Id: 1.0.0.1
Network Type: BROADCAST  Cost: 1           State: BACKUP

Designated Router Id: 2.0.0.2      local address:
fe80::218:b1ff:fea1:6c01

Backup Designated Router Id: 1.0.0.1      local address:
fe80::222:ff:fe7d:5d00

Transmit Delay: 1 sec    Priority: 1      IfOptions: 0x0
Timer intervals configured:
Hello: 10,  Dead: 40,  Retransmit: 5
Hello due in 6 sec
Neighbor Count is: 1,  Adjacent neighbor count is: 1
Adjacent with neighbor 2.0.0.2
```

`/info/l3/ospf3/dbase`
OSPFv3 Database Information Menu

```
[OSPFv3 Database Menu]
    asext   - External LS Database info
    interprf - Inter Area Prefix LS Database info
    interrtr - Inter Area Router LS Database info
    intraprf - Intra Area Prefix LS Database info
    link    - Link LS Database info
    network - Network LS Database info
    rtr     - Router LS Database info
    nssa    - NSSA LS Database info
    all     - All
```

Table 42   OSPFv3 Database Information Options

Command Syntax and Usage

`asext [detail|hex]`

Displays AS-External LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

`interprf [detail|hex]`

Displays Inter-Area Prefix LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

`interrtr [detail|hex]`

Displays Inter-Area router LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

`intraprf [detail|hex]`

Displays Intra-Area Prefix LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

`link [detail|hex]`

Displays Link LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

`network [detail|hex]`

Displays Network LSAs database information for the selected area. If no parameter is supplied, it displays condensed information.

`rtr [detail|hex]`

Displays the Router LSAs with detailed information of each field of the LSAs. If no parameter is supplied, it displays condensed information.

`nssa [detail|hex]`

Displays NSSA database information for the selected area. If no parameter is supplied, it displays condensed information.

`all [detail|hex]`

Displays all the LSAs for the selected area. If no parameter is supplied, it displays condensed information.

/info/l3/ospf3/routes
OSPFv3 Route Codes Information

```
Dest/           NextHp/          Cost  Rt. Type     Area
Prefix-Length   IfIndex
3ffe::10:0:0:0  fe80::290:69ff   30    interArea    0.0.0.0
/80              fe90:b4bf /vlan1
3ffe::20:0:0:0  fe80::290:69ff   20    interArea    0.0.0.0
/80              fe90:b4bf /vlan1
3ffe::30:0:0:0  ::        /vlan2 10    intraArea    0.0.0.0
/80
3ffe::60:0:0:6  fe80::211:22ff   10    interArea    0.0.0.0
/128             fe33:4426 /vlan2
```

/info/l3/rip
Routing Information Protocol Information

```
[RIP Information Menu]
     routes  - Show RIP routes
     dump    - Show RIP user's configuration
```

Use this menu to view information about the Routing Information Protocol (RIP) configuration and statistics.

Table 43   RIP Information Options

Command Syntax and Usage

routes

Displays RIP routes. For more information, see page 113.

dump   *<interface number or zero for all IFs)>*

Displays RIP user's configuration. For more information, see page 113.

`/info/l3/rip/routes`
RIP Routes Information

```
>> IP Routing# /info/l3/rip/routes

30.1.1.0/24 directly connected
3.0.0.0/8 via 30.1.1.11 metric 4
4.0.0.0/16 via 30.1.1.11 metric 16
10.0.0.0/8 via 30.1.1.2 metric 3
20.0.0.0/8 via 30.1.1.2 metric 2
```

This table contains all dynamic routes learnt through RIP, including the routes that are undergoing garbage collection with metric = 16. This table does not contain locally configured static routes.

`/info/l3/rip/dump` *<interface number>*
RIP Interface Information

```
RIP USER CONFIGURATION :
        RIP on update 30
        RIP Interface 1 : 10.4.4.2,          enabled
        version 2, listen enabled, supply enabled, default none
        poison disabled, split horizon enabled, trigg enabled,
        mcast enabled, metric 1
        auth none,key none
```

`/info/l3/route6`
IPv6 Routing Information

```
[IP6 Routing Menu]
     find     - Show a single route by destination IP address
     gw       - Show routes to a single next hop
     type     - Show routes of a single type
     if       - Show routes on a single interface
     summ     - Show routes summary
     dump     - Show all routes
```

Table 44 describes the IPv6 Routing information options.

Table 44 IPv6 Routing Information Options

Command Syntax and Usage

find *<IP address (such as 3001:0:0:0:0:0:abcd:12)>*

Displays a single route by destination IP address.

gw *<default gateway address (such as 3001:0:0:0:0:0:abcd:14)>*

Displays routes to a single gateway.

Table 44   IPv6 Routing Information Options

Command Syntax and Usage
type connected|static|ospf Displays routes of a single type. For a description of IP routing types, see Table 33 on page 95.
if *<interface number>* Displays routes on a single interface.
summ Displays a summary of IPv6 routing information, including inactive routes.
dump Displays all IPv6 routing information. For more information, see page 114.

/info/l3/route6/dump
IPv6 Routing Table Information

```
IPv6 Routing Table  -  3 entries
Codes : C - Connected, S - Static
        O - OSPF

S    ::/0 [1/20]
        via 2001:2:3:4::1, Interface 2
C    2001:2:3:4::/64 [1/1]
        via ::, Interface 2
C    fe80::20f:6aff:feec:f701/128 [1/1]
        via ::, Interface 2
```

Note that the first number inside the brackets represents the metric and the second number represents the preference for the route.

/info/l3/nbrcache
IPv6 Neighbor Discovery Cache Information

```
[IP6 Neighbor Discovery Protocol Menu]
     find      - Show a single NBR Cache entry by IP address
     port      - Show NBR Cache entries on a single port
     vlan      - Show NBR Cache entries on a single VLAN
     dump      - Show all NBR Cache entries
```

Table 45 describes IPv6 Neighbor Discovery cache information menu options.

Table 45   IPv6 Neighbor Discovery Cache Information Options

Command Syntax and Usage

find *<IPv6 address>*

Shows a single Neighbor Discovery cache entry by IP address.

port *<port alias or number>*

Shows the Neighbor Discovery cache entries on a single port.

vlan *<VLAN number>*

Shows the Neighbor Discovery cache entries on a single VLAN.

dump

Shows all Neighbor Discovery cache entries.

For more information, see .

/info/l3/nbrcache/dump
IPv6 Neighbor Discovery Cache Dump

```
IPv6 Address             Age   Link-layer Addr   State      IF  VLAN Port
------------------------ ----  ----------------- --------- --- ---- ----
2001:2:3:4::1            10    00:50:bf:b7:76:b0 Reachable 2   1       1
fe80::250:bfff:feb7:76b0  0    00:50:bf:b7:76:b0 Stale     2   1       2
```

`/info/l3/ndprefix`
IPv6 Neighbor Discovery Prefix Information

```
Codes: A - Address ,  P - Prefix-Advertisement
        D - Default , N - Not Advertised
      [L] - On-link Flag is set
      [A] - Autonomous Flag is set

AD 10:: 64 [LA] Valid lifetime 2592000 , Preferred lifetime 604800
P 20:: 64 [LA] Valid lifetime 200 , Preferred lifetime 100
```

Neighbor Discovery prefix information includes information about all configured prefixes.

`/info/l3/ecmp`
ECMP Static Route Information

```
Current ecmp static routes:
Destination     Mask            Gateway         If    GW Status
--------------- --------------- --------------- ---- -----------
10.10.1.1       255.255.255.255 100.10.1.1       1    up
                                200.20.2.2       1    down

10.20.2.2       255.255.255.255 10.233.3.3       1    up
10.20.2.2       255.255.255.255 10.234.4.4       1    up
10.20.2.2       255.255.255.255 10.235.5.5       1    up

ECMP health-check ping interval: 1
ECMP health-check retries number: 3
ECMP Hash Mechanism: dipsip
```

ECMP route information shows the status of each ECMP route configured on the switch.

/info/l3/if
Interface Information

```
Interface information:
  1: IP4 172.31.35.5     255.255.0.0  172.31.255.255,  vlan 1, up
  2: IP6 2002:0:0:0:0:0:0:5/64                         , vlan 1, up
          fe80::213:aff:fe4f:7c01
```

For each interface, the following information is displayed:

■ IPv4 interface address and subnet mask

■ IPv6 address and prefix

■ VLAN assignment

■ Status (up, down, disabled)

/info/l3/ip
IP Information

```
IP information:
AS number 0

Interface information:
  1: 10.200.30.3 255.255.0.0 10.200.255.255, vlan 1, up
  127: IP6 10:90:90:0:0:0:0:91/64 , vlan 4095, up
       fe80::222:ff:fe7d:717e
  128: IP4 172.31.30.128 255.255.0.0 172.31.255.255, vlan 4095, up

Loopback interface information:
2: 2.2.2.2 255.255.255.0 2.2.2.255, enabled

Default gateway information: metric strict
  1: 10.200.1.1, vlan any, up
  132: 172.31.1.1, vlan 4095, up active

Default IP6 gateway information:

Current BOOTP relay settings: OFF
Global servers:
------------------------
Server 1 address 0.0.0.0
Server 2 address 0.0.0.0
Server 3 address 0.0.0.0
Server 4 address 0.0.0.0

Current IP forwarding settings: ON, dirbr disabled, noicmprd disabled,
ICMPv6 redirect disabled
```

IP information includes:

- IP interface information: Interface number, IP address, subnet mask, broadcast address, VLAN number, and operational status.

- Loopback interface information, if applicable

- Default gateway information: Metric for selecting which configured gateway to use, gateway number, IP address, and health status

- BootP relay settings

- IP forwarding settings, including the forwarding status of directed broadcasts, and the status of ICMP re-directs

- Network filter settings, if applicable

- Route map settings, if applicable

/info/l3/igmp
IGMP Multicast Group Information

```
[IGMP Multicast Menu]
     mrouter  - Show IGMP Snooping Multicast Router Port information
     find     - Show a single group by IP group address
     vlan     - Show groups on a single vlan
     port     - Show groups on a single port
     trunk    - Show groups on a single trunk
     detail   - Show detail of a single group by IP group address
     dump     - Show all groups
```

Table 46 describes the commands used to display information about IGMP groups learned by the switch.

Table 46   IGMP Multicast Group Information Options

Command Syntax and Usage

mrouter

Displays IGMP Multicast Router menu. To view menu options, see page 120.

find *<IP address>*

Displays a single IGMP multicast group by its IP address.

vlan *<VLAN number>*

Displays all IGMP multicast groups on a single VLAN.

port *<port number or alias>*

Displays all IGMP multicast groups on a single port.

trunk *<trunk number>*

Displays all IGMP multicast groups on a single trunk group.

detail *<IP address>*

Displays details about IGMP multicast groups, including source and timer information.

dump

Displays information for all multicast groups. For details, see page 120

/info/l3/igmp/mrouter
IGMP Multicast Router Port Information

```
[IGMP Multicast Router Menu]
     vlan    - Show all multicast router ports on a single vlan
     dump    - Show all learned multicast router ports
```

Table 47 describes the commands used to display information about multicast routers (Mrouters) learned through IGMP Snooping.

Table 47   IGMP Mrouter Information Options

Command Syntax and Usage

vlan *<VLAN number>*

Displays the multicast router ports configured or learned on the selected VLAN.

dump

Displays information for all multicast groups learned by the switch.

/info/l3/igmp/mrouter/dump
IGMP Multicast Router Dump Information

```
SrcIP                VLAN    Port     Version   Expires   MRT       QRV   QQIC

-------------------- ------- -------  --------- --------  -------   ----  ----
10.1.1.1             2       21       V3        4:09      128       2     125
10.1.1.5             2       23       V2        4:09      125       -     -
10.10.10.43          9       24       V2        static    unknown   -     -
```

IGMP Mrouter information includes:

■ Source IP address

■ VLAN and port where the Mrouter is connected

■ IGMP version

■ Mrouter expiration

■ Maximum query response time

■ Querier's Robustness Variable (QRV)

■ Querier's Query Interval Code (QQIC)

`/info/l3/igmp/dump`
IGMP Group Information

```
Note: Local groups (224.0.0.x) are not snooped/relayed and will not appear.
     Source          Group        VLAN   Port   Version   Mode  Expires  Fwd
  --------------  --------------  -------  ------  --------  -----  -------  ---
  10.1.1.1        232.1.1.1          2      4       V3      INC    4:16    Yes
  10.1.1.5        232.1.1.1          2      4       V3      INC    4:16    Yes
     *            232.1.1.1          2      4       V3      INC     -      No
  10.10.10.43     235.0.0.1          9      1       V3      INC    2:26    Yes
     *            236.0.0.1          9      1       V3      EXC     -      Yes
```

IGMP Group information includes:

- ■ IGMP source address

- ■ IGMP Group address

- ■ VLAN and port

- ■ IGMP version

- ■ IGMPv3 filter mode

- ■ Expiration timer value

- ■ IGMP multicast forwarding state

`/info/l3/vrrp`
VRRP Information

Virtual Router Redundancy Protocol (VRRP) support on the G8000 provides redundancy between routers in a LAN. This is accomplished by configuring the same virtual router IP address and ID number on each participating VRRP-capable routing device. One of the virtual routers is then elected as the master, based on a number of priority criteria, and assumes control of the shared virtual router IP address. If the master fails, one of the backup virtual routers will assume routing authority and take control of the virtual router IP address.

```
VRRP information:
  1: vrid 2, 205.178.18.210, if  1, renter, prio 100, master
  2: vrid 1, 205.178.18.202, if  1, renter, prio 100, backup
  3: vrid 3, 205.178.18.204, if  1, renter, prio 100, master
```

When virtual routers are configured, you can view the status of each virtual router using this command. VRRP information includes:

- Virtual router number
- Virtual router ID and IP address
- Interface number
- Ownership status
  - □ owner identifies the preferred master virtual router. A virtual router is the owner when the IP address of the virtual router and its IP interface are the same.
  - □ renter identifies virtual routers which are not owned by this device.

- Priority value. During the election process, the virtual router with the highest priority becomes master.

- Activity status
  - □ master identifies the elected master virtual router.
  - □ backup identifies that the virtual router is in backup mode.
  - □ init identifies that the virtual router is waiting for a startup event.
    For example, once it receives a startup event, it transitions to master if its priority is 255, (the IP address owner), or transitions to backup if it is not the IP address owner.

`/info/l3/ip6pmtu` [*<destination IPv6 address>*]
IPv6 Path MTU Information

```
Path MTU Discovery info:

Max Cache Entry Number : 10
Current Cache Entry Number: 2
Cache  Timeout Interval : 10 minutes


Destination Address                        Since      PMTU
5000:1::3                                  00:02:26   1400
FE80::203:A0FF:FED6:141D                   00:06:55   1280
```

Path MTU Discovery information provides information about entries in the Path MTU cache. The PMTU field indicates the maximum packet size in octets that can successfully traverse the path from the switch to the destination node. It is equal to the minimum link MTU of all the links in the path to the destination node.

/info/qos
Quality of Service Information Menu

```
[QoS Menu]
     8021p   - Show QOS 802.1p information
```

Table 48   QoS Menu Options

Command Syntax and Usage

8021p

Displays 802.1p Information. For details, see page 124.

/info/qos/8021p
802.1p Information

```
Current priority to COS queue information:
Priority  COSq  Weight
--------  ----  ------
    0        0     2
    1        0     2
    2        0     2
    3        0     2
    4        1     0
    5        1     0
    6        1     0
    7        1     0

Current port priority information:
Port    Priority  COSq  Weight
-----   --------  ----  ------
1           0        0     2
2           0        0     2
3           0        0     2
4           0        0     2
5           0        0     2
6           0        0     2
7           0        0     2
8           0        0     2
9           0        0     2
10          0        0     2
...
```

The following table describes the IEEE 802.1p priority to COS queue information.

Table 49   802.1p Priority-to-COS Queue Parameter Descriptions

Parameter	Description
Priority	Displays the 802.1p priority level.
COSq	Displays the Class of Service queue.
Weight	Displays the scheduling weight of the COS queue.

The following table describes the IEEE 802.1p port priority information.

Table 50   802.1p Port Priority Parameter Descriptions

Parameter	Description
Port	Displays the port alias.
Priority	Displays the 802.1p priority level.
COSq	Displays the Class of Service queue.
Weight	Displays the scheduling weight.

/info/acl
Access Control List Information Menu

```
[ACL Information Menu]
    acl-list - Show ACL list
    acl-list6 - Show IPv6 ACL list
    acl-grp  - Show ACL group
    vmap     - Show VMAP
```

Table 51   ACL Information Menu Options

Command Syntax and Usage

acl-list *<ACL number>*

Displays ACL list information. For details, see .

acl-list6 *<ACL number>*

Displays IPv6 ACL list information.

acl-grp *<ACL group number>*

Displays ACL group information.

vmap *<VMAP number>*

Displays VMAP information.

/info/acl/acl-list
Access Control List Information

```
Current ACL List information:
-----------------------
Filter 1 profile:
   Ethernet
     - SMAC       : 00:00:aa:aa:01:fe/ff:ff:ff:ff:ff:ff
     - DMAC       : 00:0d:60:9c:ec:d5/ff:ff:ff:ff:ff:ff
     - VID        : 10/0xfff
     - Ethertype  : IP (0x0800)
     - Priority   : 3
   Meter
     - Set to disabled
     - Set committed rate : 64
     - Set max burst size : 32
   Re-Mark
     - Set use of TOS precedence to disabled
   Packet Format
     - Ethernet format : None
     - Tagging format  : Any
     - IP format       : None
   Egress Port    : 44
   Actions        : Deny
   Statistics     : enabled

   No ACL groups configured.
   No VMAP configured.
```

Access Control List (ACL) information includes configuration settings for each ACL.

Table 52 ACL List Parameter Descriptions

Parameter	Description
Filter x profile	Indicates the ACL number.
Ethernet	Displays the ACL Ethernet header parameters, if configured.
IPv4	Displays the ACL IPv4 header parameters, if configured.
TCP/UDP	Displays the ACL TCP/UDP header parameters, if configured.
Meter	Displays the ACL meter parameters.
Re-Mark	Displays the ACL re-mark parameters.
Packet Format	Displays the ACL Packet Format parameters, if configured.
Egress Port	Displays the egress port number, if configured.

Table 52 ACL List Parameter Descriptions (continued)

Parameter	Description
Actions	Displays the configured action for the ACL.
Statistics	Displays status of ACL statistics (enabled or disabled).

/info/rmon
RMON Information Menu

```
[RMON Information Menu]
    hist    - Show RMON History group information
    alarm   - Show RMON Alarm group information
    event   - Show RMON Event group information
    dump    - Show all RMON information
```

The following table describes the Remote Monitoring (RMON) Information menu options.

Table 53 RMON Information Menu Options (/info/rmon)

Command Syntax and Usage

hist

Displays RMON History information. For details, see page 130.

alarm

Displays RMON Alarm information. For details, see page 131.

event

Displays RMON Event information. For details, see page 132.

dump

Displays all RMON information.

/info/rmon/hist
RMON History Information

```
RMON History group configuration:

Index IFOID                            Interval Rbnum Gbnum
----- ------------------------------   -------- ----- -----
    1  1.3.6.1.2.1.2.2.1.1.24                30     5     5
    2  1.3.6.1.2.1.2.2.1.1.22                30     5     5
    3  1.3.6.1.2.1.2.2.1.1.20                30     5     5
    4  1.3.6.1.2.1.2.2.1.1.19                30     5     5
    5  1.3.6.1.2.1.2.2.1.1.24              1800     5     5


Index                    Owner
----- -------------------------------------------
    1  dan
```

The following table describes the RMON History Information parameters.

Table 54   RMON History Parameter Descriptions

Parameter	Description
Index	Displays the index number that identifies each history instance.
IFOID	Displays the MIB Object Identifier.
Interval	Displays the time interval for each sampling bucket.
Rbnum	Displays the number of requested buckets, which is the number of data slots into which data is to be saved.
Gbnum	Displays the number of granted buckets that may hold sampled data.
Owner	Displays the owner of the history instance.

/info/rmon/alarm
RMON Alarm Information

```
RMON Alarm group configuration:

Index   Interval  Sample   Type       rLimit        fLimit      last value
-----   --------  ------   -------    -----------   -----------  ----------
    1       1800     abs   either              0             0        7822

Index   rEvtIdx   fEvtIdx                        OID
-----   -------   -------   -----------------------------------------
    1         0         0   1.3.6.1.2.1.2.2.1.10.1

Index                         Owner
-----   -----------------------------------------
    1   dan
```

The following table describes the RMON Alarm Information parameters.

Table 55 RMON Alarm Parameter Descriptions

Parameter	Description
Index	Displays the index number that identifies each alarm instance.
Interval	Displays the time interval over which data is sampled and compared with the rising and falling thresholds.
Sample	Displays the method of sampling the selected variable and calculating the value to be compared against the thresholds, as follows: □ abs—absolute value, the value of the selected variable is compared directly with the thresholds at the end of the sampling interval. □ delta—delta value, the value of the selected variable at the last sample is subtracted from the current value, and the difference compared with the thresholds.
Type	Displays the type of alarm, as follows: □ falling—alarm is triggered when a falling threshold is crossed. □ rising—alarm is triggered when a rising threshold is crossed. □ either—alarm is triggered when either a rising or falling threshold is crossed.
rLimit	Displays the rising threshold for the sampled statistic.
fLimit	Displays the falling threshold for the sampled statistic.

Table 55 RMON Alarm Parameter Descriptions (continued)

Parameter	Description
rEvtIdx	Displays the rising alarm event index that is triggered when a rising threshold is crossed.
fEvtIdx	Displays the falling alarm event index that is triggered when a falling threshold is crossed.
Last value	Displays the last sampled value.
OID	Displays the MIB Object Identifier for each alarm index.
Owner	Displays the owner of the alarm instance.

/info/rmon/event
RMON Event Information

```
RMON Event group configuration:

Index Type    Last Sent              Description
----- ---- --------------- ---------------------------------
    1  both   0D: 0H: 1M:20S  Event_1
    2  none   0D: 0H: 0M: 0S  Event_2
    3  log    0D: 0H: 0M: 0S  Event_3
    4  trap   0D: 0H: 0M: 0S  Event_4
    5  both   0D: 0H: 0M: 0S  Log and trap event for Link Down
   10  both   0D: 0H: 0M: 0S  Log and trap event for Link Up
   11  both   0D: 0H: 0M: 0S  Send log and trap for icmpInMsg
   15  both   0D: 0H: 0M: 0S  Send log and trap for icmpInEchos


Index                   Owner
----- -------------------------------------------
    1  dan
```

The following table describes the RMON Event Information parameters.

Table 56 RMON Event Parameter Descriptions

Parameter	Description
Index	Displays the index number that identifies each event instance.
Type	Displays the type of notification provided for this event, as follows: none, log, trap, both.
Last sent	Displays the time that passed since the last switch reboot, when the most recent event was triggered. This value is cleared when the switch reboots.

Table 56 RMON Event Parameter Descriptions (continued)

Parameter	Description
Description	Displays a text description of the event.
Owner	Displays the owner of the event instance.

`/info/link`
Link Status Information

```
Alias    Port    Speed    Duplex     Flow Ctrl        Link
-----    ----    -----    --------    --TX-----RX--    ------
1        1        any      any       yes     yes       up
2        2        1000     full      yes     yes       up
3        3        any      any       yes     yes       down
4        4        any      any       yes     yes       down
5        5        any      any       yes     yes       down
6        6        any      any       yes     yes       down
7        7        any      any       yes     yes       down
8        8        any      any       yes     yes       down
9        9        any      any       yes     yes       down
10       10       any      any       yes     yes       down
11       11       any      any       yes     yes       down
12       12       any      any       yes     yes       down
13       13       any      any       yes     yes       down
14       14       any      any       yes     yes       down
15       15       any      any       yes     yes       down
16       16       any      any       yes     yes       down
17       17       any      any       yes     yes       down
18       18       any      any       yes     yes       down
...
```

Use this command to display link status information about each port on a G8000 slot, including:

- Port alias and number

- Port speed

- Duplex mode (half, full, any)

- Flow control for transmit and receive (no, yes, or both)

- Link status (up, down, or disabled)

/info/port
Port Information

```
Port Tag    Type    RMON Lrn Fld PVID      NAME            VLAN(s)
---- --- ---------- ---- --- --- ----- ------------- --------------------
1    n   External    d    e   e    1               1
2    n   External    d    e   e    1               1
3    n   External    d    e   e    1               1
4    n   External    d    e   e    1               1
5    n   External    d    e   e    1               1
6    n   External    d    e   e    1               1
7    n   External    d    e   e    1               1
8    n   External    d    e   e    1               1
9    n   External    d    e   e    1               1
10   n   External    d    e   e    1               1
11   n   External    d    e   e    1               1
12   n   External    d    e   e    1               1
13   n   External    d    e   e    1               1
14   n   External    d    e   e    1               1
15   n   External    d    e   e    1               1
16   n   External    d    e   e    1               1
17   n   External    d    e   e    1               1
18   n   External    d    e   e    1               1
...
* = PVID is tagged.
```

Port information includes:

- Port alias and number
- Whether the port uses VLAN tagging or not (y or n)
- Type of port
- Whether the port has Remote Monitoring (RMON) enabled
- Whether the port has FDB learning enabled (**Lrn**)
- Whether the port has Port Flood Blocking enabled (**Fld**)
- Port VLAN ID (**PVID**)
- Port name
- VLAN membership

`/info/transcvr`
Port Transceiver Status

```
Name               TX  RXLos TXFlt Volts DegsC TXuW  RXuW  Media   Laser  Approval
---------------- --- ----- ----- ----- ----- ----- ----- ------- ------ --------
45 Extn45 SFP  1 Extn45 SFP  1   < NO Device Installed >
46 Extn46 SFP  2 Extn46 SFP  2   < NO Device Installed >
47 Extn47 SFP  3 Extn47 SFP  3   < NO Device Installed >
48 Extn48 SFP  4 Extn48 SFP  4   < NO Device Installed >
49 Frnt49 SFP+ 1 Ena Down  no    3.27 34.5  554.8 542.8 SR SFP+ 850nm  Approved
         Blade Network    Part:BN-CKM-SP-SR    Date:090610 S/N:AD0924ER0B5
50 Frnt50 SFP+ 2 Ena Down  no    3.31 38.5  570.4 541.3 SR SFP+ 850nm  Approved
         Blade Network    Part:BN-CKM-SP-SR    Date:080512 S/N:AD0820ER02N
51 Back51 SFP+ 1 Back51 SFP+ 1   < NO Device Installed >
52 Back52 SFP+ 2 Back52 SFP+ 2   < NO Device Installed >


Modules:
 IO Module         Type          Part Number           Serial
-----------     -----------     ----------------      -----------
Front module    SFP+            ************          ************
Rear module     Not inserted
```

This command displays information about the transceiver module on each port, as follows:

- Name identifies the port number and media type
- TX: Transmission status
- RXlos: Receive Loss of Signal indicator
- TXFlt: Transmission Fault indicator
- Volts: Power usage, in volts
- DegsC: Temperature, in degrees centigrade
- TXuW: Transmit power, in micro-watts
- RXuW: Receive power, in micro-watts
- Media type (LX, LR, SX, SR)
- Laser wavelength, in nano-meters
- Approval status

/info/virt
Virtualization Information

```
[Virtualization Menu]
     vm        - Show Virtual Machine information
```

Table 57 describes general virtualization information options. More details are available in the following sections.

Table 57 Virtualization Information Options (/info/virt)

Command Syntax and Usage

vm

Displays the Virtual Machines (VM) information menu. For details, see page 137.

/info/virt/vm
Virtual Machines Information

```
[Virtual Machine Menu]
     vmware    - Show VMware-specific information
     port      - Show per port Virtual Machine information
     dump      - Show all the Virtual Machine information
```

Table 58 Virtual Machines (VM) Information Options (/info/virt/vm)

Command Syntax and Usage

vmware

Displays the VMware-specific information menu.

port

Displays Virtual Machine information for the selected port.

dump

Displays all Virtual Machine information. For details, see page 137.

/info/virt/vm/dump
Virtual Machine (VM) Information

```
IP Address        VMAC Address      Index Port    VM Group (Profile)
---------------   ----------------  ----- ------- ------------------
*127.31.46.50     00:50:56:4e:62:f5  4      3
*127.31.46.10     00:50:56:4f:f2:85  2      4
+127.31.46.51     00:50:56:72:ec:86  1      3
+127.31.46.11     00:50:56:7c:1c:ca  3      4
 127.31.46.25     00:50:56:9c:00:c8  5      4
 127.31.46.15     00:50:56:9c:21:2f  0      4
 127.31.46.35     00:50:56:9c:29:29  6      3

Number of entries: 8
* indicates VMware ESX Service Console Interface
+ indicates VMware ESX/ESXi VMKernel or Management Interface
```

VM information includes the following for each Virtual Machine (VM):

- IP address
- MAC address
- Index number assigned to the VM
- Server port on which the VM was detected
- VM group that contains the VM, if applicable

/info/virt/vm/vmware
VMware Information

```
[VMware-specific Information Menu]
   hosts    - Show the names of all VMware Hosts in Data Center
   showhost - Show networking information for the specified VMware Host
   showvm   - Show networking information for the specified VMware VM
   vms      - Show the names of all VMware VMs in the Data Center
```

Use these commands to display information about Virtual Machines (VMs) and VMware hosts in the data center. These commands require the presence of a configured Virtual Center.

Table 59   VMware Information Options (/info/virt/vm/vmware)

Command Syntax and Usage

hosts

Displays a list of VMware hosts. For details, see page 139.

showhost *<host UUID>***|***<host IP address>***|***<host host name>*

Displays detailed information about a specific VMware host.

Table 59   VMware Information Options (/info/virt/vm/vmware)

Command Syntax and Usage

---

showvm *<VM UUID>* **|** *<VM IP address>* **|** *<VM name>*

Displays detailed information about a specific Virtual Machine (VM).

---

vms

Displays a list of VMs.

/info/virt/vm/vmware/hosts
VMware Host Information

```
UUID                                 Name(s), IP Address


-------------------------------------------------------------------
80a42681-d0e5-5910-a0bf-bd23bd3f7803  127.12.41.30
3c2e063c-153c-dd11-8b32-a78dd1909a69  127.12.46.10
64f1fe30-143c-dd11-84f2-a8ba2cd7ae40  127.12.44.50
c818938e-143c-dd11-9f7a-d8defa4b83bf  127.12.46.20
fc719af0-093c-dd11-95be-b0adac1bcf86  127.12.46.30
009a581a-143c-dd11-be4c-c9fb65ff04ec  127.12.46.40
```

VM host information includes the following:

■   UUID associated with the VMware host.

■   Name or IP address of the VMware host.

/info/dump
Information Dump

Use the dump command to dump all switch information available from the Information menu (10K or more, depending on your configuration). This data is useful for tuning and debugging switch performance.

If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

CHAPTER 5
The Statistics Menu

You can view switch performance statistics in both the user and administrator command modes. This chapter discusses how to use the command line interface to display switch statistics.

/stats
Statistics Menu

```
[Statistics Menu]
    port     - Port Stats Menu
    l2       - Layer 2 Stats Menu
    l3       - Layer 3 Stats Menu
    mp       - MP-specific Stats Menu
    acl      - ACL Stats Menu
    snmp     - Show SNMP stats
    ntp      - Show NTP stats
    clrmp    - Clear all MP related stats
    clrports - Clear stats for all ports
    dump     - Dump all stats
```

The information provided by each menu option is briefly described in Table 60, with pointers to detailed information.

Table 60   Statistics Menu Options

Command Syntax and Usage

port *<port alias or number>*

Displays the Port Statistics menu for the specified port. Use this command to display traffic statistics on a port-by-port basis. Traffic statistics are included in SNMP Management Information Base (MIB) objects. To view menu options, see page 143.

l2

Displays the Layer 2 Statistics menu. To view menu options, see page 160.

Table 60   Statistics Menu Options

Command Syntax and Usage

l3

Displays the Layer 3 Stats menu. To view menu options, see page 169.

mp

Displays the Management Processor Statistics menu. Use this command to view information on how switch management processes and resources are currently being allocated. To view menu options, see page 204.

acl

Displays ACL Statistics menu. To view menu options, see page 210.

snmp

Displays SNMP statistics. See page 212 for sample output.

ntp [**clear**]

Displays Network Time Protocol (NTP) Statistics. See page 216 for a sample output and a description of NTP Statistics.

You can use the clear option to delete all NTP statistics.

clrmp

Clears all management processor statistics.

clrports

Clears statistics counters for all ports.

dump

Dumps all switch statistics. Use this command to gather data for tuning and debugging switch performance. If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump command. For details, see page 217.

/stats/port *<port alias or number>*
Port Statistics Menu

This menu allows you to display traffic statistics on a port-by-port basis. Traffic statistics include SNMP Management Information Base (MIB) objects.

```
[Port Statistics Menu]
     8021x   - Show 802.1x stats
     amp     - Show AMP stats
     brg     - Show bridging ("dot1") stats
     brg-rate - Show bridging ("dot1") stats/second
     ether   - Show Ethernet ("dot3") stats
     eth-rate - Show Ethernet ("dot3") stats/second
     if      - Show interface ("if") stats
     if-rate - Show interface ("if") stats/second
     ip      - Show Internet Protocol ("IP") stats
     ip-rate - Show Internet Protocol ("IP") stats/second
     link    - Show link stats
     maint   - Show port maintenance stats
     rmon    - Show RMON stats
     dump    - Show all port stats
     clear   - Clear all port stats
```

Table 61 Port Statistics Options

Command Syntax and Usage

8021x

Displays IEEE 802.1x statistics for the port. See page 146 for sample output.

brg

Displays bridging ("dot1") statistics for the port. See page 150 for sample output.

brg-rate

Displays per-second bridging ("dot1") statistics for the port.

ether

Displays Ethernet ("dot3") statistics for the port. See page 151 for sample output.

eth-rate

Displays per-second Ethernet ("dot3") statistics for the port.

if

Displays interface statistics for the port. See page 154 for sample output.

Table 61 Port Statistics Options

Command Syntax and Usage

if-rate

Displays per-second interface statistics for the port.

ip

Displays IP statistics for the port. See page 156 for sample output.

ip-rate

Displays per-second IP statistics for the port.

link

Displays link statistics for the port. See page 156 for sample output.

maint

Displays detailed maintenance statistics for the port.

rmon

Displays Remote Monitoring (RMON) statistics for the port. See page 157 for sample output.

dump

This command dumps all statistics for the selected port.

clear

This command clears all the statistics on the selected port.

/stats/port *<port alias or number>*/8021x
802.1x Authenticator Statistics

This option displays the 802.1x authenticator statistics of the selected port.

```
Authenticator Statistics:
  eapolFramesRx         = 925
  eapolFramesTx         = 3201
  eapolStartFramesRx    = 2
  eapolLogoffFramesRx   = 0
  eapolRespIdFramesRx   = 463
  eapolRespFramesRx     = 460
  eapolReqIdFramesTx    = 1820
  eapolReqFramesTx      = 1381
  invalidEapolFramesRx  = 0
  eapLengthErrorFramesRx = 0
  lastEapolFrameVersion = 1
  lastEapolFrameSource  = 00:01:02:45:ac:51
```

Table 62 802.1x Authenticator Statistics of a Port

Statistics	Description
eapolFramesRx	Total number of EAPOL frames received
eapolFramesTx	Total number of EAPOL frames transmitted
eapolStartFramesRx	Total number of EAPOL Start frames received
eapolLogoffFramesRx	Total number of EAPOL Logoff frames received
eapolRespIdFramesRx	Total number of EAPOL Response Identity frames received
eapolRespFramesRx	Total number of Response frames received
eapolReqIdFramesTx	Total number of Request Identity frames transmitted
eapolReqFramesTx	Total number of Request frames transmitted
invalidEapolFramesRx	Total number of invalid EAPOL frames received
eapLengthErrorFramesRx	Total number of EAP length error frames received
lastEapolFrameVersion	The protocol version number carried in the most recently received EAPOL frame.
lastEapolFrameSource	The source MAC address carried in the most recently received EAPOL frame.

/stats/port *<port alias or number>*/8021x
802.1x Authenticator Diagnostics

This option displays the 802.1x authenticator diagnostics of the selected port.

```
Authenticator Diagnostics:
  authEntersConnecting                   = 1820
  authEapLogoffsWhileConnecting          = 0
  authEntersAuthenticating               = 463
  authSuccessesWhileAuthenticating       = 5
  authTimeoutsWhileAuthenticating        = 0
  authFailWhileAuthenticating            = 458
  authReauthsWhileAuthenticating         = 0
  authEapStartsWhileAuthenticating       = 0
  authEapLogoffWhileAuthenticating       = 0
  authReauthsWhileAuthenticated          = 3
  authEapStartsWhileAuthenticated        = 0
  authEapLogoffWhileAuthenticated        = 0
  backendResponses                       = 923
  backendAccessChallenges                = 460
  backendOtherRequestsToSupplicant       = 460
  backendNonNakResponsesFromSupplicant = 460
  backendAuthSuccesses                   = 5
  backendAuthFails                       = 458
```

Table 63   802.1x Authenticator Diagnostics of a Port

Statistics	Description
authEntersConnecting	Total number of times that the state machine transitions to the CONNECTING state from any other state.
authEapLogoffsWhile Connecting	Total number of times that the state machine transitions from CONNECTING to DISCONNECTED as a result of receiving an EAPOL-Logoff message.
authEnters Authenticating	Total number of times that the state machine transitions from CONNECTING to AUTHENTICATING, as a result of an EAP-Response/Identity message being received from the Supplicant.
authSuccessesWhile Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to AUTHENTICATED, as a result of the Backend Authentication state machine indicating successful authentication of the Supplicant.
authTimeoutsWhile Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of the Backend Authentication state machine indicating authentication timeout.

Table 63 802.1x Authenticator Diagnostics of a Port

Statistics	Description
authFailWhile Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to HELD, as a result of the Backend Authentication state machine indicating authentication failure.
authReauthsWhile Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of a re-authentication request
authEapStartsWhile Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of an EAPOL-Start message being received from the Supplicant.
authEapLogoffWhile Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of an EAPOL-Logoff message being received from the Supplicant.
authReauthsWhile Authenticated	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of a re-authentication request.
authEapStartsWhile Authenticated	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of an EAPOL-Start message being received from the Supplicant.
authEapLogoffWhile Authenticated	Total number of times that the state machine transitions from AUTHENTICATED to DISCONNECTED, as a result of an EAPOL-Logoff message being received from the Supplicant.
backendResponses	Total number of times that the state machine sends an initial Access-Request packet to the Authentication server. Indicates that the Authenticator attempted communication with the Authentication Server.
backendAccess Challenges	Total number of times that the state machine receives an initial Access-Challenge packet from the Authentication server. Indicates that the Authentication Server has communication with the Authenticator.
backendOtherRequests ToSupplicant	Total number of times that the state machine sends an EAP-Request packet (other than an Identity, Notification, Failure, or Success message) to the Supplicant. Indicates that the Authenticator chose an EAP-method.

Table 63 802.1x Authenticator Diagnostics of a Port

Statistics	Description
backendNonNak ResponsesFrom Supplicant	Total number of times that the state machine receives a response from the Supplicant to an initial EAP-Request, and the response is something other than EAP-NAK. Indicates that the Supplicant can respond to the Authenticator.s chosen EAP-method.
backendAuthSuccesses	Total number of times that the state machine receives an Accept message from the Authentication Server. Indicates that the Supplicant has successfully authenticated to the Authentication Server.
backendAuthFails	Total number of times that the state machine receives a Reject message from the Authentication Server. Indicates that the Supplicant has not authenticated to the Authentication Server.

/stats/port *<port alias or number>*/amp [clear]
Active MultiPath Statistics

This option displays the Active MultiPath Protocol (AMP) statistics of the selected port.

```
AMP statistics for port 1:
Keep-alive packets sent:                  0
Keep-alive packets rcvd:                  0
Fdb-Flush  packets sent:                  0
Fdb-Flush  packets rcvd:                  0
Dropped packets        :                  0
```

Table 64 AMP Statistics of a Port

Statistics	Description
Keep-alive packets sent	Number of keep-alive packets sent.
Keep-alive packets rcvd	Number of keep-alive packets received.
Fdb-Flush packets sent	Number of FDB-flush packets sent.
Fdb-Flush packets rcvd	Number of FDB-flush packets received.
Dropped packets	Number of invalid AMP packets dropped.

Use the clear option to delete AMP port statistics.

/stats/port *<port alias or number>*/brg
Bridging Statistics

This option displays the bridging statistics of the selected port.

```
Bridging statistics for port 1:
dot1PortInFrames:                   63242584
dot1PortOutFrames:                  63277826
dot1PortInDiscards:                        0
dot1TpLearnedEntryDiscards:                0
dot1StpPortForwardTransitions:             0
```

Table 65 Bridging Statistics of a Port

Statistics	Description
dot1PortInFrames	The number of frames that have been received by this port from its segment. A frame received on the interface corresponding to this port is only counted by this object if and only if it is for a protocol being processed by the local bridging function, including bridge management frames.
dot1PortOutFrames	The number of frames that have been transmitted by this port to its segment. Note that a frame transmitted on the interface corresponding to this port is only counted by this object if and only if it is for a protocol being processed by the local bridging function, including bridge management frames.
dot1PortInDiscards	Count of valid frames received which were discarded (that is, filtered) by the Forwarding Process.
dot1TpLearnedEntry Discards	The total number of Forwarding Database entries, which have been or would have been learnt, but have been discarded due to a lack of space to store them in the Forwarding Database. If this counter is increasing, it indicates that the Forwarding Database is regularly becoming full (a condition which has unpleasant performance effects on the subnetwork). If this counter has a significant value but is not presently increasing, it indicates that the problem has been occurring but is not persistent.
dot1StpPortForward Transitions	The number of times this port has transitioned from the Learning state to the Forwarding state.

/stats/port *<port alias or number>*/ether
Ethernet Statistics

This option displays the ethernet statistics of the selected port

```
Ethernet statistics for port 1:
dot3StatsAlignmentErrors:              0
dot3StatsFCSErrors:                    0
dot3StatsSingleCollisionFrames:        0
dot3StatsMultipleCollisionFrames:      0
dot3StatsLateCollisions:               0
dot3StatsExcessiveCollisions:          0
dot3StatsInternalMacTransmitErrors:    NA
dot3StatsFrameTooLongs:                0
dot3StatsInternalMacReceiveErrors:     0
```

Table 66 Ethernet Statistics of a Port

Statistics	Description
dot3StatsAlignment Errors	A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the Frame Check Sequence (FCS) check.
	The count represented by an instance of this object is incremented when the alignmentError status is returned by the MAC service to the Logical Link Control (LLC) (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
dot3StatsFCSErrors	A count of frames received on a particular interface that are an integral number of octets in length but do not pass the Frame Check Sequence (FCS) check.
	The count represented by an instance of this object is incremented when the frameCheckError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.

Table 66   Ethernet Statistics of a Port

Statistics	Description
dot3StatsSingleCollision Frames	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision.
	A frame that is counted by an instance of this object is also counted by the corresponding instance of either the `ifOutUcastPkts`, `ifOutMulticastPkts`, or `ifOutBroadcastPkts`, and is not counted by the corresponding instance of the `dot3StatsMultipleCollisionFrame` object.
dot3StatsMultiple CollisionFrames	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by more than one collision.
	A frame that is counted by an instance of this object is also counted by the corresponding instance of either the `ifOutUcastPkts`, `ifOutMulticastPkts`, or `ifOutBroadcastPkts`, and is not counted by the corresponding instance of the `dot3StatsSingleCollisionFrames` object.
dot3StatsLateCollisions	The number of times that a collision is detected on a particular interface later than 512 bit-times into the transmission of a packet.
	Five hundred and twelve bit-times corresponds to 51.2 microseconds on a 10 Mbit/s system. A (late) collision included in a count represented by an instance of this object is also considered as a (generic) collision for purposes of other collision-related statistics.
dot3StatsExcessive Collisions	A count of frames for which transmission on a particular interface fails due to excessive collisions.
dot3StatsInternalMac TransmitErrors	A count of frames for which transmission on a particular interface fails due to an internal MAC sub layer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the `dot3StatsLateCollisions` object, the `dot3StatsExcessiveCollisions` object, or the `dot3StatsCarrierSenseErrors` object.
	The precise meaning of the count represented by an instance of this object is implementation-specific. In particular, an instance of this object may represent a count of transmission errors on a particular interface that are not otherwise counted.

Table 66   Ethernet Statistics of a Port

Statistics	Description
dot3StatsFrameToo Longs	A count of frames received on a particular interface that exceed the maximum permitted frame size.
	The count represented by an instance of this object is incremented when the `frameTooLong` status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
dot3StatsInternalMac ReceiveErrors	A count of frames for which reception on a particular interface fails due to an internal MAC sub layer receive error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the `dot3StatsFrameTooLongs` object, the `dot3StatsAlignmentErrors` object, or the `dot3StatsFCSErrors` object.
	The precise meaning of the count represented by an instance of this object is implementation-specific. In particular, an instance of this object may represent a count of received errors on a particular interface that are not otherwise counted.

/stats/port *<port alias or number>*/if
Interface Statistics

This option displays the interface statistics of the selected port.

```
Interface statistics for port 1:
                ifHCIn Counters      ifHCOut Counters
Octets:               51697080313         51721056808
UcastPkts:               65356399            65385714
BroadcastPkts:                  0                6516
MulticastPkts:                  0                   0
FlowCtrlPkts:                   0                   0
Discards:                       0                   0
Errors:                         0               21187
```

Table 67   Interface Statistics of a Port

Statistics	Description
ifInOctets	The total number of octets received on the interface, including framing characters.
ifInUcastPkts	The number of packets, delivered by this sub-layer to a higher sub-layer, which were not addressed to a multicast or broadcast address at this sub-layer.
ifInBroadcastPkts	The number of packets, delivered by this sub-layer to a higher sub-layer, which were addressed to a broadcast address at this sub-layer.
ifInMulticastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast address at this sub-layer, including those that were discarded or not sent. For a MAC layer protocol, this includes both Group and Functional addresses.
ifInFlowControlPkts	The total number of flow control pause packets received on the interface.
ifInDiscards	The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.

Table 67 Interface Statistics of a Port

Statistics	Description
ifInErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.
ifOutOctets	The total number of octets transmitted out of the interface, including framing characters.
ifOutUcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were not addressed to a multicast or broadcast address at this sub-layer, including those that were discarded or not sent.
ifOutBroadcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a broadcast address at this sub-layer, including those that were discarded or not sent. This object is a 64-bit version of `ifOutBroadcastPkts`.
ifOutMulticastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast address at this sub-layer, including those that were discarded or not sent. For a MAC layer protocol, this includes both Group and Functional addresses. This object is a 64-bit version of `ifOutMulticastPkts`.
ifOutFlowControlPkts	The total number of flow control `pause` packets transmitted out of the interface.
ifOutDiscards	The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
ifOutErrors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.

/stats/port *<port alias or number>*/ip
Interface Protocol Statistics

This option displays the interface statistics of the selected port.

```
GEA IP statistics for port 1:
ipInReceives   :         0
ipInHeaderError:         0
ipInDiscards   :         0
```

Table 68   Interface Protocol Statistics of a Port

Statistics	Description
ipInReceives	The total number of input datagrams received from interfaces, including those received in error.
ipInHeaderErrors	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity (the switch).
ipInDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.

/stats/port *<port alias or number>*/link
Link Statistics

This option displays link statistics of the selected port.

```
Link statistics for port 1:
linkStateChange:          1
```

Table 69   Link Statistics of a Port

Statistics	Description
linkStateChange	The total number of link state changes.

/stats/port *<port alias or number>*/rmon
RMON Statistics

This menu enables you to display the Remote Monitoring (RMON) statistics of the selected port.

```
RMON statistics for port 2:

etherStatsDropEvents:              NA
etherStatsOctets:                   0
etherStatsPkts:                     0
etherStatsBroadcastPkts:            0
etherStatsMulticastPkts:            0
etherStatsCRCAlignErrors:           0
etherStatsUndersizePkts:            0
etherStatsOversizePkts:             0
etherStatsFragments:               NA
etherStatsJabbers:                  0
etherStatsCollisions:               0
etherStatsPkts64Octets:             0
etherStatsPkts65to127Octets:        0
etherStatsPkts128to255Octets:       0
etherStatsPkts256to511Octets:       0
etherStatsPkts512to1023Octets:      0
etherStatsPkts1024to1518Octets:     0
```

Table 70 RMON Statistics of a Port

Statistics	Description
etherStatsDropEvents	The total number of packets received that were dropped because of system resource constraints.
etherStatsOctets	The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets).
etherStatsPkts	The total number of packets (including bad packets, broadcast packets, and multicast packets) received.
etherStatsBroadcastPkts	The total number of good packets received that were directed to the broadcast address.
etherStatsMulticastPkts	The total number of good packets received that were directed to a multicast address.

Table 70   RMON Statistics of a Port

Statistics	Description
etherStatsCRCAlignErrors	The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).
etherStatsUndersizePkts	The total number of packets received that were less than 64 octets long (excluding framing bits but including FCS octets) and were otherwise well formed.
etherStatsOversizePkts	The total number of packets received that were longer than 1518 octets (excluding framing bits but including FCS octets) and were otherwise well formed.
etherStatsFragments	The total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).
etherStatsJabbers	The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Jabber is defined as the condition where any packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms.
etherStatsCollisions	The best estimate of the total number of collisions on this Ethernet segment.
etherStatsPkts64Octets	The total number of packets (including bad packets) received that were less than or equal to 64 octets in length (excluding framing bits but including FCS octets).
etherStatsPkts65to127 Octets	The total number of packets (including bad packets) received that were greater than 64 octets in length (excluding framing bits but including FCS octets).
etherStatsPkts128to255 Octets	The total number of packets (including bad packets) received that were greater than 127 octets in length (excluding framing bits but including FCS octets).
etherStatsPkts256to511 Octets	The total number of packets (including bad packets) received that were greater than 255 octets in length (excluding framing bits but including FCS octets).

Table 70   RMON Statistics of a Port

Statistics	Description
etherStatsPkts512to1023 Octets	The total number of packets (including bad packets) received that were greater than 511 octets in length (excluding framing bits but including FCS octets).
etherStatsPkts1024to1518 Octets	The total number of packets (including bad packets) received that were greater than 1023 octets in length (excluding framing bits but including FCS octets).

/stats/l2
Layer 2 Statistics Menu

```
[Layer 2 Statistics Menu]
     amp      - AMP Stats Menu
     fdb      - Show FDB stats
     lacp     - Show LACP stats
     hotlink  - Show Hot Links stats
     lldp     - Show LLDP port stats
     oam      - Show OAM stats
```

The Layer 2 statistics provided by each menu option are briefly described in Table 71, with pointers to detailed information.

Table 71   Layer 2 Statistics Menu Options

Command Syntax and Usage

amp

Displays Active MultiPath (AMP) statistics. See page 161 for sample output.

fdb [**clear**]

Displays FDB statistics. See page 163 for sample output.

Use the clear option to delete all FDB statistics.

lacp [<*port alias or number*>|**clear**]

Displays Link Aggregation Control Protocol (LACP) statistics for a specified port, or for all ports if no port is specified. See page 164 for sample output.

Use the clear option to delete all LACP statistics.

hotlink

Displays Hotlinks statistics. See page 165 for sample output.

lldp [<*port alias or number*>|**clear**]

Displays LLDP port statistics. See page 166 for sample output.

oam

Displays the OAM Statistics menu. See page 167 for sample output.

`/stats/l2/amp`
Active MultiPath Statistics

```
[AMP Statistics Menu]
     group   - Show AMP group stats
     dump    - Show all AMP port stats
     clear   - Clear AMP stats
```

The following table describes the AMP statistics commands:

Table 72 AMP Statistics Options

Command Syntax and Usage

`group [` *<AMP group number>* **`]`**

Displays AMP statistics for the selected group. See for sample output.

`dump`

Displays all AMP statistics.

`clear [` *<AMP group number>* **`]`**

Clears AMP statistics.

/stats/l2/amp/group [*<AMP group number>*]
Active MultiPath Group Statistics

```
                     Keep-alive Pkts       Fdb-Flush  Pkts          Pkts
Group   Link         Sent      Rcvd        Sent       Rcvd          Dropped
-----   -----------  --------------------  --------------------  ---------
1       Trunk 2      22        22          0          0             0
        Trunk 3      22        21          0          0             0
2       Trunk 2      22        22          0          0             0
        Trunk 13     22        22          0          0             0
3       Trunk 2      22        22          0          0             0
        Port 5       22        22          0          0             0
```

This displays shows AMP group statistics for an aggregator switch. AMP statistics are described in the following table:

Table 73 AMP Statistics

Statistic	Description
Group	AMP group number.
Link	Ports/portchannels (trunks) used for the AMP link.
Keep-alive Pkts Sent	Number of keep-alive packets sent.
Keep-alive Pkts Rcvd	Number of keep-alive packets received.
Fdb-Flush Pkts Sent	Number of FDB-flush packets sent.
Fdb-Flush Pkts Rcvd	Number of FDB-flush packets received.
Packets Dropped	Number of invalid AMP packets dropped.

/stats/l2/fdb [clear]
FDB Statistics

```
FDB statistics:
 current:           83   hiwat:            855
```

This option displays statistics regarding the use of the forwarding database, including the number of new entries, finds, and unsuccessful searches.

FDB statistics are described in the following table:

Table 74   Forwarding Database Statistics

Statistic	Description
current	Current number of entries in the Forwarding Database.
hiwat	Highest number of entries recorded at any given time in the Forwarding Database.

Use the clear option to delete all FDB statistics.

`/stats/l2/lacp [`<*port alias or number*>`|clear]`
LACP Statistics

```
Port 1:
  ------------------------------------
 Valid LACPDUs received:        - 870
 Valid Marker PDUs received:    - 0
 Valid Marker Rsp PDUs received: - 0
 Unknown version/TLV type:      - 0
 Illegal subtype received:      - 0
 LACPDUs transmitted:           - 6031
 Marker PDUs transmitted:       - 0
 Marker Rsp PDUs transmitted:   - 0
```

Link Aggregation Control Protocol (LACP) statistics are described in the following table:

Table 75 LACP Statistics

Statistic	Description
Valid LACPDUs received	Total number of valid LACP data units received.
Valid Marker PDUs received	Total number of valid LACP marker data units received.
Valid Marker Rsp PDUs received	Total number of valid LACP marker response data units received.
Unknown version/TLV type	Total number of LACP data units with an unknown version or type, length, and value (TLV) received.
Illegal subtype received	Total number of LACP data units with an illegal subtype received.
LACPDUs transmitted	Total number of LACP data units transmitted.
Marker PDUs transmitted	Total number of LACP marker data units transmitted.
Marker Rsp PDUs transmitted	Total number of LACP marker response data units transmitted.

Use the `clear` option to delete all LACP statistics.

/stats/l2/hotlink
Hotlinks Statistics

```
Hot Links Trigger Stats:

Trigger 1 statistics:
    Trigger Name: Trigger 1
    Master active:          0
    Backup active:          0
    FDB update:             0    failed: 0
```

The following table describes the Hotlinks statistics:

Table 76 Hotlinks Statistics

Statistic	Description
Master active	Total number of times the Master interface transitioned to the Active state.
Backup active	Total number of times the Backup interface transitioned to the Active state.
FDB update	Total number of FDB update requests sent.
failed	Total number of FDB update requests that failed.

`/stats/l2/lldp` *<port alias or number>***`|clear`**
LLDP Port Statistics

```
LLDP Port 1 Statistics
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Frames Transmitted        : 0
Frames Received           : 0
Frames Received in Errors : 0
Frames Discarded          : 0
TLVs Unrecognized         : 0
Neighbors Aged Out        : 0
...
```

The following table describes the LLDP port statistics:

Table 77 LLDP Port Statistics

Statistic	Description
Frames Transmitted	Total number of LLDP frames transmitted.
Frames Received	Total number of LLDP frames received.
Frames Received in Errors	Total number of LLDP frames that had errors.
Frames Discarded	Total number of LLDP frames discarded.
TLVs Unrecognized	Total number of unrecognized TLV (Type, Length, and Value) fields received.
Neighbors Aged Out	Total number of neighbor devices that have had their LLDP information aged out.

/stats/l2/oam
OAM Statistics

```
[OAM statistics Menu]
     port     - Show OAM port statistics
     dump     - Show all OAM statistics
```

The following table describes the OAM statistics commands:

Table 78   OAM Statistics Options

Command Syntax and Usage

port *<port alias or number>*

Displays OAM statistics for the selected port. See for sample output.

dump

Displays all OAM statistics.

/stats/l2/oam/port *<port alias or number>*
OAM Statistics

```
OAM statistics on port 1
-----------------------------------------
Information OAMPDU Tx :      0
Information OAMPDU Rx :      0
Unsupported OAMPDU Tx :      0
Unsupported OAMPDU Tx :      0

Local faults
-------------
    0 Link fault records
    0 Critical events
    0 Dying gasps

Remote faults
-------------
    0 Link fault records
    0 Critical events
    0 Dying gasps
```

OAM statistics include the following:

- Total number of OAM Protocol Data Units (OAMPDU) transmitted and received.
- Total number of unsupported OAM Protocol Data Units (OAMPDU) transmitted and received.
- Local faults detected
- Remote faults detected

/stats/l3
Layer 3 Statistics Menu

```
[Layer 3 Statistics Menu]
    geal3    - GEA Layer 3 Stats Menu
    ip       - Show IP stats
    ip6      - Show IP6 stats
    route    - Show route stats
    route6   - Show route6 stats
    pmtu6    - Show ipv6 path mtu stats
    arp      - Show ARP stats
    dns      - Show DNS stats
    icmp     - Show ICMP stats
    tcp      - Show TCP stats
    udp      - Show UDP stats
    igmp     - Show IGMP stats
    ospf     - OSPF stats
    ospf3    - OSPFv3 stats
    vrrp     - Show VRRP stats
    rip      - Show RIP stats
    igmpgrps - Total number of IGMP groups
    ipmcgrps - Total number of IPMC groups
    clrigmp  - Clear IGMP stats
    ipclear  - Clear IP stats
    ip6clear - Clear IP6 stats
    clrvrrp  - Clear VRRP stats
    ripclear - Clear RIP stats
    ospfclr  - Clear all OSPF stats
    ospf3clr - Clear all OSPFv3 stats
    dump     - Dump layer 3 stats
```

The Layer 3 statistics provided by each menu option are briefly described in Table 79, with pointers to detailed information.

Table 79 Layer 3 Statistics Menu Options

Command Syntax and Usage

geal3

Displays the Gigabit Ethernet Aggregators (GEA) statistics menu. GEA statistics are used by service and support personnel.

ip

Displays IP statistics. See page 173 for sample output.

Table 79 Layer 3 Statistics Menu Options

Command Syntax and Usage

ip6

Displays IPv6 statistics. See page 176 for sample output.

route [**clear**]

Displays route statistics. See page 181 for sample output.

Use the clear option to delete all route statistics.

route6 [**clear**]

Displays IPv6 route statistics. See page 182 for sample output.

Use the clear option to delete all route statistics.

pmtu6

Displays IPv6 Path MTU statistics. See page 182 for sample output.

arp [**clear**]

Displays Address Resolution Protocol (ARP) statistics. See page 183 for sample output.

dns [**clear**]

Displays Domain Name System (DNS) statistics. See page 184 for sample output.

Use the clear option to delete all DNS statistics.

icmp [**clear**]

Displays ICMP statistics. See page 185 for sample output.

Use the clear option to delete all ICMP statistics.

tcp [**clear**]

Displays TCP statistics. See page 187 for sample output.

Use the clear option to delete all TCP statistics.

udp [**clear**]

Displays UDP statistics. See page 189 for sample output.

Use the clear option to delete all UDP statistics.

igmp

Displays IGMP statistics. See page 190 for sample output.

Table 79 Layer 3 Statistics Menu Options

Command Syntax and Usage

ospf

Displays OSPF statistics. See page 192 for sample output.

ospf3

Displays OSPFv3 statistics. See page 197 for sample output.

vrrp

When virtual routers are configured, you can display the protocol statistics for VRRP. See page 202 for sample output.

rip

Displays Routing Information Protocol (RIP) statistics. See page 203 for sample output.

igmpgrps

Displays the total number of IGMP groups that are registered on the switch.

ipmcgrps

Displays the total number of current IP multicast groups that are registered on the switch.

clrigmp

Clears IGMP statistics.

ipclear

Clears IPv4 statistics. Use this command with caution as it will delete all the IPv4 statistics.

ip6clear

Clears IPv6 statistics. Use this command with caution as it will delete all the IPv6 statistics.

clrvrrp

Clears VRRP statistics.

ripclear

Clears Routing Information Protocol (RIP) statistics.

ospfclear

Clears Open Shortest Path First (OSPF) statistics.

Table 79   Layer 3 Statistics Menu Options

Command Syntax and Usage

`ospf3clr`

   Clears OSPFv3 statistics.

`dump`

   Dumps all Layer 3 statistics. Use this command to gather data for tuning and debugging switch performance. If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump command.

/stats/l3/ip
IPv4 Statistics

```
IP statistics:
ipInReceives:         3115873   ipInHdrErrors:            1
ipInAddrErrors:         35447   ipForwDatagrams:          0
ipInUnknownProtos:     500504   ipInDiscards:             0
ipInDelivers:         2334166   ipOutRequests:      1010542
ipOutDiscards:              4   ipOutNoRoutes:            4
ipReasmReqds:               0   ipReasmOKs:               0
ipReasmFails:               0   ipFragOKs:                0
ipFragFails:                0   ipFragCreates:            0
ipRoutingDiscards:          0   ipDefaultTTL:           255
ipReasmTimeout:             5
```

Table 80 IP Statistics

Statistics	Description
ipInReceives	The total number of input datagrams received from interfaces, including those received in error.
ipInHdrErrors	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so forth.
ipInAddrErrors	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity (the switch). This count includes invalid addresses (for example, 0.0.0.0) and addresses of unsupported Classes (for example, Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.
ipForwDatagrams	The number of input datagrams for which this entity (the switch) was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. In entities which do not act as IP Gateways, this counter will include only those packets, which were Source-Routed via this entity (the switch), and the Source- Route option processing was successful.
ipInUnknownProtos	The number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.

Table 80 IP Statistics

Statistics	Description
ipInDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.
ipInDelivers	The total number of input datagrams successfully delivered to IP user-protocols (including ICMP).
ipOutRequests	The total number of IP datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission. Note that this counter does not include any datagrams counted in `ipForwDatagrams`.
ipOutDiscards	The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). Note that this counter would include datagrams counted in `ipForwDatagrams` if any such packets met this (discretionary) discard criterion.
ipOutNoRoutes	The number of IP datagrams discarded because no route could be found to transmit them to their destination. Note that this counter includes any packets counted in `ipForwDatagrams`, which meet this *no-route* criterion. Note that this includes any datagrams which a host cannot route because all of its default gateways are down.
ipReasmReqds	The number of IP fragments received which needed to be reassembled at this entity (the switch).
ipReasmOKs	The number of IP datagrams successfully re- assembled.
ipReasmFails	The number of failures detected by the IP re- assembly algorithm (for whatever reason: timed out, errors, and so forth). Note that this is not necessarily a count of discarded IP fragments since some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received.
ipFragOKs	The number of IP datagrams that have been successfully fragmented at this entity (the switch).
ipFragFails	The number of IP datagrams that have been discarded because they needed to be fragmented at this entity (the switch) but could not be, for example, because their `Don't Fragment` flag was set.

Table 80   IP Statistics

Statistics	Description
ipFragCreates	The number of IP datagram fragments that have been generated as a result of fragmentation at this entity (the switch).
ipRoutingDiscards	The number of routing entries, which were chosen to be discarded even though they are valid. One possible reason for discarding such an entry could be to free-up buffer space for other routing entries.
ipDefaultTTL	The default value inserted into the `Time-To-Live` (TTL) field of the IP header of datagrams originated at this entity (the switch), whenever a TTL value is not supplied by the transport layer protocol.
ipReasmTimeout	The maximum number of seconds, which received fragments are held while they are awaiting reassembly at this entity (the switch).

/stats/l3/ip6
IPv6 Statistics

```
    IPv6 Statistics
    ***************
144  Rcvd           0    HdrErrors      0    TooBigErrors
0    AddrErrors     0    FwdDgrams      0    UnknownProtos
0    Discards       144  Delivers       130  OutRequests
0    OutDiscards    0    OutNoRoutes    0    ReasmReqds
0    ReasmOKs       0    ReasmFails
0    FragOKs        0    FragFails      0    FragCreates
7    RcvdMCastPkt   2    SentMcastPkts  0    TruncatedPkts
0    RcvdRedirects  0    SentRedirects
    ICMP Statistics
    ***************
    Received :
33   ICMPPkts      0 ICMPErrPkt       0 DestUnreach   0 TimeExcds
0    ParmProbs     0 PktTooBigMsg     9 ICMPEchoReq   10 ICMPEchoReps
0    RouterSols    0 RouterAdv        5 NeighSols     9 NeighAdv
0    Redirects     0 AdminProhib      0 ICMPBadCode
    Sent
19   ICMPMsgs      0 ICMPErrMsgs      0 DstUnReach    0 TimeExcds
0    ParmProbs     0 PktTooBigs       10 EchoReq      9 EchoReply
0    RouterSols    0 RouterAdv        11 NeighSols    5 NeighborAdv
0    RedirectMsgs 0 AdminProhibMsgs
    UDP statistics
    **************
    Received :
0 UDPDgrams     0 UDPNoPorts        0 UDPErrPkts
    Sent :
0 UDPDgrams
```

The following table describes the IPv6 statistics.

Table 81   IPv6 Statistics

Statistics	Description
Rcvd	Number of datagrams received from interfaces, including those received in error.
HdrErrors	Number of datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so forth.
TooBigErrors	The number of input datagrams that could not be forwarded because their size exceeded the link MTU of outgoing interface.

Table 81   IPv6 Statistics

Statistics	Description
AddrErrors	Number of datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity (the switch). This count includes invalid addresses. For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.
FwdDgrams	Number of input datagrams for which this entity (the switch) was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. In entities which do not act as IP Gateways, this counter will include only those packets, which were Source-Routed via this entity (the switch), and the Source- Route option processing was successful.
UnknownProtos	Number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
Discards	Number of IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.
Delivers	Number of datagrams successfully delivered to IP user-protocols (including ICMP).
OutRequests	Number of IP datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission.
OutDiscards	Number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space).
OutNoRoutes	Number of IP datagrams discarded because no route could be found to transmit them to their destination. Note that this includes any datagrams which a host cannot route because all of its default gateways are down.
ReasmReqds	Number of IP fragments received which needed to be reassembled at this entity (the switch).
ReasmOKs	Number of IP datagrams successfully re- assembled.

Table 81 IPv6 Statistics

Statistics	Description
ReasmFails	Number of failures detected by the IP re- assembly algorithm (for whatever reason: timed out, errors, and so forth). Note that this is not necessarily a count of discarded IP fragments since some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received.
FragOKs	Number of IP datagrams that have been successfully fragmented at this entity (the switch).
FragFails	Number of IP datagrams that have been discarded because they needed to be fragmented at this entity (the switch) but could not be, for example, because their Don't Fragment flag was set.
FragCreates	Number of IP datagram fragments that have been generated as a result of fragmentation at this entity (the switch).
RcvdMCastPkt	The number of multicast packets received by the interface.
SentMcastPkts	The number of multicast packets transmitted by the interface.
TruncatedPkts	The number of input datagrams discarded because datagram frame didn't carry enough data.
RcvdRedirects	The number of Redirect messages received by the interface.
SentRedirects	The number of Redirect messages sent.

The following table describes the IPv6 ICMP statistics.

Table 82 ICMP Statistics

Statistics	Description
	Received
ICMPPkts	Number of ICMP messages which the entity (the switch) received.
ICMPErrPkt	Number of ICMP messages which the entity (the switch) received but determined as having ICMP-specific errors (bad ICMP checksums, bad length, and so forth).
DestUnreach	Number of ICMP Destination Unreachable messages received.
TimeExcds	Number of ICMP Time Exceeded messages received.
ParmProbs	Number of ICMP Parameter Problem messages received.
PktTooBigMsg	The number of ICMP Packet Too Big messages received by the interface.

Table 82 ICMP Statistics

Statistics	Description
ICMPEchoReq	Number of ICMP Echo (request) messages received.
ICMPEchoReps	Number of ICMP Echo Reply messages received.
RouterSols	Number of Router Solicitation messages received by the switch.
RouterAdv	Number of Router Advertisements received by the switch.
NeighSols	Number of Neighbor Solicitations received by the switch.
NeighAdv	Number of Neighbor Advertisements received by the switch.
Redirects	Number of ICMP Redirect messages received.
AdminProhib	The number of ICMP destination unreachable/communication administratively prohibited messages received by the interface.
ICMPBadCode	The number of ICMP Parameter Problem messages received by the interface.
Sent	
ICMPMsgs	Number of ICMP messages which this entity (the switch) attempted to send.
ICMPErrMsgs	Number of ICMP messages which this entity (the switch) did not send due to problems discovered within ICMP such as a lack of buffer. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations there may be no types of errors that contribute to this counter's value.
DstUnReach	Number of ICMP Destination Unreachable messages sent.
TimeExcds	Number of ICMP Time Exceeded messages sent.
ParmProbs	Number of ICMP Parameter Problem messages sent.
PktTooBigs	The number of ICMP Packet Too Big messages sent by the interface.
EchoReq	Number of ICMP Echo (request) messages sent.
EchoReply	Number of ICMP Echo Reply messages sent.
RouterSols	Number of Router Solicitation messages sent by the switch.
RouterAdv	Number of Router Advertisements sent by the switch.
NeighSols	Number of Neighbor Solicitations sent by the switch.
NeighAdv	Number of Neighbor Advertisements sent by the switch.

Table 82   ICMP Statistics

Statistics	Description
RedirectMsgs	Number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.
AdminProhibMsgs	Number of ICMP destination unreachable/communication administratively prohibited messages sent.

The following table describes the UDP statistics.

Table 83   UDP Statistics

Statistics	Description
Received	
UDPDgrams	Number of UDP datagrams received by the switch.
UDPNoPorts	Number of received UDP datagrams for which there was no application at the destination port.
UDPErrPkts	Number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
Sent	
UDPDgrams	Number of UDP datagrams sent from this entity (the switch).

/stats/l3/route [clear]
Route Statistics

```
Route statistics:
ipRoutesCur:                11  ipRoutesHighWater:         11
ipRoutesMax:             4096
```

Table 84 Route Statistics

Statistics	Description
ipRoutesCur	The total number of outstanding routes in the route table.
ipRoutesHighWater	The highest number of routes ever recorded in the route table.
ipRoutesMax	The maximum number of routes that are supported.

Use the clear option to delete all route statistics.

/stats/l3/route6 [clear]
IPv6 Route Statistics

```
IPV6 Route statistics:
ipv6RoutesCur:                4   ipv6RoutesHighWater:          6
ipv6RoutesMax:            1156

ECMP statistics:
---------------
Maximum number of ECMP routes         :         600
Max ECMP paths allowed for one route :          5
```

Table 85 IPv6 Route Statistics

Statistics	Description
ipv6RoutesCur	Total number of outstanding routes in the route table.
ipv6RoutesHighWater	Highest number of routes ever recorded in the route table.
ipv6RoutesMax	Maximum number of routes that are supported.
Maximum number of ECMP routes	Maximum number of ECMP routes supported.
Max ECMP paths allowed for one route	Maximum number of ECMP paths supported for each route.

Use the clear option to delete all IPv6 route statistics.

`/stats/l3/pmtu6`
IPv6 Path MTU Statistics

```
Max Cache Entry Number : 10
Current Cache Entry Number: 0
```

Table 86   Path MTU Statistics

Statistics	Description
Max Cache Entry Number	Maximum number of Path MTU entries that are supported.
Current Cache Entry Number	Total number of Path MTU entries in the Path MTU table.

`/stats/l3/arp`
ARP Statistics

This option displays Address Resolution Protocol (ARP) statistics.

```
ARP statistics:
arpEntriesCur:           3  arpEntriesHighWater:        4
arpEntriesMax:        4095
```

Table 87   ARP Statistics

Statistics	Description
arpEntriesCur	The total number of outstanding ARP entries in the ARP table.
arpEntriesHighWater	The highest number of ARP entries ever recorded in the ARP table.
arpEntriesMax	The maximum number of ARP entries that are supported.

/stats/l3/dns [clear]
DNS Statistics

This menu option enables you to display Domain Name System statistics.

```
DNS statistics:
dnsOutRequests:              0
dnsBadRequests:              0
```

Table 88   DNS Statistics

Statistics	Description
dnsOutRequests	The total number of DNS response packets that have been transmitted.
dnsBadRequests	The total number of DNS request packets received that were dropped.

Use the clear option to delete all DNS statistics.

/stats/l3/icmp [clear]
ICMP Statistics

```
ICMP statistics:
icmpInMsgs:              245802    icmpInErrors:              1393
icmpInDestUnreachs:          41    icmpInTimeExcds:              0
icmpInParmProbs:              0    icmpInSrcQuenchs:             0
icmpInRedirects:              0    icmpInEchos:                 18
icmpInEchoReps:          244350    icmpInTimestamps:             0
icmpInTimestampReps:          0    icmpInAddrMasks:              0
icmpInAddrMaskReps:           0    icmpOutMsgs:             253810
icmpOutErrors:                0    icmpOutDestUnreachs:         15
icmpOutTimeExcds:             0    icmpOutParmProbs:             0
icmpOutSrcQuenchs:            0    icmpOutRedirects:             0
icmpOutEchos:            253777    icmpOutEchoReps:             18
icmpOutTimestamps:            0    icmpOutTimestampReps:         0
icmpOutAddrMasks:             0    icmpOutAddrMaskReps:          0
```

Table 89   ICMP Statistics

Statistics	Description
icmpInMsgs	The total number of ICMP messages which the entity (the switch) received. Note that this counter includes all those counted by icmpInErrors.
icmpInErrors	The number of ICMP messages which the entity (the switch) received but determined as having ICMP-specific errors (bad ICMP checksums, bad length, and so forth).
icmpInDestUnreachs	The number of ICMP Destination Unreachable messages received.
icmpInTimeExcds	The number of ICMP Time Exceeded messages received.
icmpInParmProbs	The number of ICMP Parameter Problem messages received.
icmpInSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages received.
icmpInRedirects	The number of ICMP Redirect messages received.
icmpInEchos	The number of ICMP Echo (request) messages received.
icmpInEchoReps	The number of ICMP Echo Reply messages received.
icmpInTimestamps	The number of ICMP Timestamp (request) messages received.
icmpInTimestampReps	The number of ICMP Timestamp Reply messages received.

Table 89   ICMP Statistics

Statistics	Description
icmpInAddrMasks	The number of ICMP Address Mask Request messages received.
icmpInAddrMaskReps	The number of ICMP Address Mask Reply messages received.
icmpOutMsgs	The total number of ICMP messages which this entity (the switch) attempted to send. Note that this counter includes all those counted by `icmpOutErrors`.
icmpOutErrors	The number of ICMP messages which this entity (the switch) did not send due to problems discovered within ICMP such as a lack of buffer. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations there may be no types of errors that contribute to this counter's value.
icmpOutDestUnreachs	The number of ICMP Destination Unreachable messages sent.
icmpOutTimeExcds	The number of ICMP Time Exceeded messages sent.
icmpOutParmProbs	The number of ICMP Parameter Problem messages sent.
icmpOutSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages sent.
icmpOutRedirects	The number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.
icmpOutEchos	The number of ICMP Echo (request) messages sent.
icmpOutEchoReps	The number of ICMP Echo Reply messages sent.
icmpOutTimestamps	The number of ICMP Timestamp (request) messages sent.
icmpOutTimestampReps	The number of ICMP Timestamp `Reply` messages sent.
icmpOutAddrMasks	The number of ICMP Address Mask Request messages sent.
icmpOutAddrMaskReps	The number of ICMP Address Mask Reply messages sent.

Use the `clear` option to delete all ICMP statistics.

/stats/l3/tcp [clear]
TCP Statistics

```
TCP statistics:
tcpRtoAlgorithm:         4    tcpRtoMin:                 0
tcpRtoMax:          240000    tcpMaxConn:               512
tcpActiveOpens:     252214    tcpPassiveOpens:           7
tcpAttemptFails:       528    tcpEstabResets:            4
tcpInSegs:          756401    tcpOutSegs:           756655
tcpRetransSegs:          0    tcpInErrs:                 0
tcpCurBuff:              0    tcpCurConn:                3
tcpOutRsts:            417
```

Table 90 TCP Statistics

Statistics	Description
tcpRtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
tcpRtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.
tcpRtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.
tcpMaxConn	The limit on the total number of TCP connections the entity (the switch) can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.
tcpActiveOpens	The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
tcpPassiveOpens	The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.

Table 90 TCP Statistics

Statistics	Description
tcpAttemptFails	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
tcpEstabResets	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
tcpInSegs	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
tcpOutSegs	The total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.
tcpRetransSegs	The total number of segments retransmitted - that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
tcpInErrs	The total number of segments received in error (for example, bad TCP `checksums`).
tcpCurBuff	The total number of outstanding memory allocations from heap by TCP protocol stack.
tcpCurConn	The total number of outstanding TCP sessions that are currently opened.
tcpOutRsts	The number of TCP segments sent containing the RST flag.

Use the `clear` option to delete all TCP statistics.

/stats/l3/udp [clear]
UDP Statistics

```
UDP statistics:
udpInDatagrams:          54    udpOutDatagrams:          43
udpInErrors:              0    udpNoPorts:          1578077
```

Table 91 UDP Statistics

Statistics	Description
udpInDatagrams	The total number of UDP datagrams delivered to the switch.
udpOutDatagrams	The total number of UDP datagrams sent from this entity (the switch).
udpInErrors	The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
udpNoPorts	The total number of received UDP datagrams for which there was no application at the destination port.

Use the clear option to delete all UDP statistics.

/stats/l3/igmp *<VLAN number>*
IGMP Statistics

```
IGMP Snoop vlan 2 statistics:
-----------------------------------------------------------------------
rxIgmpValidPkts:                0    rxIgmpInvalidPkts:              0
rxIgmpGenQueries:               0    rxIgmpGrpSpecificQueries:       0
rxIgmpGroupSrcSpecificQueries:  0    rxIgmpDiscardPkts:              0
rxIgmpLeaves:                   0    rxIgmpReports:                  0
txIgmpReports:                  0    txIgmpGrpSpecificQueries:       0
txIgmpLeaves:                   0    rxIgmpV3CurrentStateRecords:    0
rxIgmpV3SourceListChangeRecords:0    rxIgmpV3FilterChangeRecords:    0
```

This option displays statistics about the use of the IGMP Multicast Groups. IGMP statistics are described in the following table:

Table 92 IGMP Statistics

Statistic	Description
rxIgmpValidPkts	Total number of valid IGMP packets received
rxIgmpInvalidPkts	Total number of invalid packets received
rxIgmpGenQueries	Total number of General Membership Query packets received
rxIgmpGrpSpecific Queries	Total number of Membership Query packets received from specific groups
rxIgmpGroupSrcSpecific Queries	Total number of Group Source-Specific Queries (GSSQ) received
rxIgmpDiscardPkts	Total number of IGMP packets discarded
rxIgmpLeaves	Total number of Leave requests received
rxIgmpReports	Total number of Membership Reports received
txIgmpReports	Total number of Membership reports transmitted
txIgmpGrpSpecific Queries	Total number of Membership Query packets transmitted to specific groups
txIgmpLeaves	Total number of Leave messages transmitted
rxIgmpV3CurrentState Records	Total number of Current State records received

Table 92   IGMP Statistics

Statistic	Description
rxIgmpV3SourceList ChangeRecords	Total number of Source List Change records received.
rxIgmpV3FilterChange Records	Total number of Filter Change records received.

/stats/l3/ospf
OSPF Statistics

```
[OSPF stats Menu]
      general - Show global stats
      aindex  - Show area(s) stats
      if      - Show interface(s) stats
```

Table 93   OSPF Statistics Options

Command Syntax and Usage

general

Displays global statistics. See for sample output.

aindex

Displays area statistics.

if

Displays interface statistics.

/stats/l3/ospf/general
OSPF General Statistics

The OSPF General Statistics contain the sum total of all OSPF packets received on all OSPF areas and interfaces.

```
OSPF stats
----------
Rx/Tx Stats:          Rx            Tx
                   --------      --------
  Pkts                 0             0
  hello               23           518
  database             4            12
  ls requests          3             1
  ls acks              7             7
  ls updates           9             7

Nbr change stats:                 Intf change Stats:
  hello               2              up             4
  start               0              down           2
  n2way               2              loop           0
  adjoint ok          2              unloop         0
  negotiation done    2              wait timer     2
  exchange done       2              backup         0
  bad requests        0              nbr change     5
  bad sequence        0
  loading done        2
  n1way               0
  rst_ad              0
  down                1

Timers kickoff
  hello             514
  retransmit       1028
  lsa lock            0
  lsa ack             0
  dbage               0
  summary             0
  ase export          0
```

Table 94 OSPF General Statistics

Statistics	Description
Rx/Tx Stats:	
Rx Pkts	The sum total of all OSPF packets received on all OSPF areas and interfaces.
Tx Pkts	The sum total of all OSPF packets transmitted on all OSPF areas and interfaces.
Rx Hello	The sum total of all Hello packets received on all OSPF areas and interfaces.
Tx Hello	The sum total of all Hello packets transmitted on all OSPF areas and interfaces.
Rx Database	The sum total of all Database Description packets received on all OSPF areas and interfaces.
Tx Database	The sum total of all Database Description packets transmitted on all OSPF areas and interfaces.
Rx ls Requests	The sum total of all Link State Request packets received on all OSPF areas and interfaces.
Tx ls Requests	The sum total of all Link State Request packets transmitted on all OSPF areas and interfaces.
Rx ls Acks	The sum total of all Link State Acknowledgement packets received on all OSPF areas and interfaces.
Tx ls Acks	The sum total of all Link State Acknowledgement packets transmitted on all OSPF areas and interfaces.
Rx ls Updates	The sum total of all Link State Update packets received on all OSPF areas and interfaces.
Tx ls Updates	The sum total of all Link State Update packets transmitted on all OSPF areas and interfaces.
Nbr Change Stats:	
hello	The sum total of all Hello packets received from neighbors on all OSPF areas and interfaces.
Start	The sum total number of neighbors in this state (that is, an indication that Hello packets should now be sent to the neighbor at intervals of `HelloInterval` seconds.) across all OSPF areas and interfaces.

Table 94 OSPF General Statistics

Statistics	Description
n2way	The sum total number of bidirectional communication establishment between this router and other neighboring routers.
adjoint ok	The sum total number of decisions to be made (again) as to whether an adjacency should be established/maintained with the neighbor across all OSPF areas and interfaces.
negotiation done	The sum total number of neighbors in this state wherein the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, across all OSPF areas and interfaces.
exchange done	The sum total number of neighbors in this state (that is, in an adjacency's final state) having transmitted a full sequence of Database Description packets, across all OSPF areas and interfaces.
bad requests	The sum total number of Link State Requests which have been received for a link state advertisement not contained in the database across all interfaces and OSPF areas.
bad sequence	The sum total number of Database Description packets which have been received that either: a. Has an unexpected DD sequence number b. Unexpectedly has the init bit set c. Has an options field differing from the last Options field received in a Database Description packet. Any of these conditions indicate that some error has occurred during adjacency establishment for all OSPF areas and interfaces.
loading done	The sum total number of link state updates received for all out-of-date portions of the database across all OSPF areas and interfaces.
n1way	The sum total number of Hello packets received from neighbors, in which this router is not mentioned across all OSPF interfaces and areas.
rst_ad	The sum total number of times the Neighbor adjacency has been reset across all OPSF areas and interfaces.
down	The total number of Neighboring routers down (that is, in the initial state of a neighbor conversation.) across all OSPF areas and interfaces.

Table 94 OSPF General Statistics

Statistics	Description
Intf Change Stats:	
up	The sum total number of interfaces up in all OSPF areas.
down	The sum total number of interfaces down in all OSPF areas.
loop	The sum total of interfaces no longer connected to the attached network across all OSPF areas and interfaces.
unloop	The sum total number of interfaces, connected to the attached network in all OSPF areas.
wait timer	The sum total number of times the Wait Timer has been fired, indicating the end of the waiting period that is required before electing a (Backup) Designated Router across all OSPF areas and interfaces.
backup	The sum total number of Backup Designated Routers on the attached network for all OSPF areas and interfaces.
nbr change	The sum total number of changes in the set of bidirectional neighbors associated with any interface across all OSPF areas.
Timers Kickoff:	
hello	The sum total number of times the Hello timer has been fired (which triggers the send of a Hello packet) across all OPSF areas and interfaces.
retransmit	The sum total number of times the Retransmit timer has been fired across all OPSF areas and interfaces.
lsa lock	The sum total number of times the Link State Advertisement (LSA) lock timer has been fired across all OSPF areas and interfaces.
lsa ack	The sum total number of times the LSA Ack timer has been fired across all OSPF areas and interfaces.
dbage	The total number of times the data base age (Dbage) has been fired.
summary	The total number of times the Summary timer has been fired.
ase export	The total number of times the Autonomous System Export (ASE) timer has been fired.

/stats/l3/ospf3
OSPFv3 Statistics Menu

```
[OSPFV3 stats Menu]
      general - Show global stats
      aindex  - Show area(s) stats
      if      - Show interface(s) stats
```

Table 95 OSPFv3 Statistics Menu

Command Syntax and Usage

general

Displays global statistics. See page 198 for sample output.

aindex

Displays area statistics.

if

Displays interface statistics.

/stats/l3/ospf3/general
OSPFv3 Global Statistics

```
OSPFv3 stats
----------
Rx/Tx/Disd Stats:            Rx              Tx          Discarded
                         --------        --------        ---------
       Pkts               9695            95933              0
       hello              9097             8994              0
       database             39               51              6
       ls requests          16                8              0
       ls acks             172              360              0
       ls updates          371              180              0

Nbr change stats:                     Intf change Stats:
  down                     0             down             5
  attempt                  0             loop             0
  init                     1             waiting          6
  n2way                    1             ptop             0
  exstart                  1             dr               4
  exchange done            1             backup           6
  loading done             1             dr other         0
  full                     1             all events      33
  all events               6

Timers kickoff
  hello                 8988
  wait                     6
  poll                     0
  nbr probe                0

Number of LSAs
  originated                          180
  rcvd newer originations             355
```

The OSPFv3 General Statistics contain the sum total of all OSPF packets received on all OSPFv3 areas and interfaces.

Table 96 OSPFv3 General Statistics

Statistics	Description
Rx/Tx Stats:	
Rx Pkts	The sum total of all OSPFv3 packets received on all OSPFv3 interfaces.
Tx Pkts	The sum total of all OSPFv3 packets transmitted on all OSPFv3 interfaces.
Discarded Pkts	The sum total of all OSPFv3 packets discarded.

Table 96 OSPFv3 General Statistics

Statistics	Description
Rx hello	The sum total of all Hello packets received on all OSPFv3 interfaces.
Tx hello	The sum total of all Hello packets transmitted on all OSPFv3 interfaces.
Discarded hello	The sum total of all Hello packets discarded, including packets for which no associated interface has been found.
Rx database	The sum total of all Database Description packets received on all OSPFv3 interfaces.
Tx database	The sum total of all Database Description packets transmitted on all OSPFv3 interfaces.
Discarded database	The sum total of all Database Description packets discarded.
Rx ls requests	The sum total of all Link State Request packets received on all OSPFv3 interfaces.
Tx ls requests	The sum total of all Link State Request packets transmitted on all OSPFv3 interfaces.
Discarded ls requests	The sum total of all Link State Request packets discarded.
Rx ls acks	The sum total of all Link State Acknowledgement packets received on all OSPFv3 interfaces.
Tx ls acks	The sum total of all Link State Acknowledgement packets transmitted on all OSPFv3 interfaces.
Discarded ls acks	The sum total of all Link State Acknowledgement packets discarded.
Rx ls updates	The sum total of all Link State Update packets received on all OSPFv3 interfaces.
Tx ls updates	The sum total of all Link State Update packets transmitted on all OSPFv3 interfaces.
Discarded ls updates	The sum total of all Link State Update packets discarded.
Nbr Change Stats:	
down	The total number of Neighboring routers down (that is, in the initial state of a neighbor conversation.) across all OSPFv3 interfaces.

Table 96 OSPFv3 General Statistics

Statistics	Description
attempt	The total number of transitions into attempt state of neighboring routers across allOSPFv3 interfaces.
init	The total number of transitions into init state of neighboring routers across all OSPFv3 interfaces.
n2way	The total number of bidirectional communication establishment between this router and other neighboring routers.
exstart	The total number of transitions into exstart state of neighboring routers across all OSPFv3 interfaces
exchange done	The total number of neighbors in this state (that is, in an adjacency's final state) having transmitted a full sequence of Database Description packets, across all OSPFv3 interfaces.
loading done	The total number of link state updates received for all out-of-date portions of the database across all OSPFv3 interfaces.
full	The total number of transitions into full state of neighboring routers across all OSPFv3 interfaces.
all events	The total number of state transitions of neighboring routers across all OSPFv3 interfaces.

Table 96 OSPFv3 General Statistics

Statistics	Description
Intf Change Stats:	
down	The total number of transitions into down state of all OSPFv3 interfaces.
loop	The total number of transitions into loopback state of all OSPFv3 interfaces.
waiting	The total number of transitions into waiting state of all OSPFv3 interfaces.
ptop	The total number of transitions into point-to-point state of all OSPFv3 interfaces.
dr	The total number of transitions into Designated Router other state of all OSPFv3 interfaces.
backup	The total number of transitions into backup state of all OSPFv3 interfaces.
all events	The total number of changes associated with any OSPFv3 interface, including changes into internal states.
Timers Kickoff:	
hello	The total number of times the Hello timer has been fired (which triggers the `send` of a Hello packet) across all OSPFv3 interfaces.
wait	The total number of times the wait timer has been fired (which causes an interface to exit waiting state), across all OPSFv3 interfaces.
poll	The total number of times the timer whose firing causes hellos to be sent to inactive NBMA and Demand Circuit neighbors has been fired, across all OPSFv3 interfaces.
nbr probe	The total number of times the neighbor probe timer has been fired, across all OPSFv3 interfaces.
Number of LSAs:	
originated	The number of LSAs originated by this router.
rcvd newer originations	The number of LSAs received that have been determined to be newer originations.

/stats/l3/vrrp
VRRP Statistics

Virtual Router Redundancy Protocol (VRRP) support on the RackSwitch G8000 (G8000) provides redundancy between routers in a LAN. This is accomplished by configuring the same virtual router IP address and ID number on each participating VRRP-capable routing device. One of the virtual routers is then elected as the master, based on a number of priority criteria, and assumes control of the shared virtual router IP address. If the master fails, one of the backup virtual routers will assume routing authority and take control of the virtual router IP address.

When virtual routers are configured, you can display the protocol statistics for VRRP:

```
VRRP statistics:
vrrpInAdvers:            0    vrrpBadAdvers:          0
vrrpOutAdvers:           0
vrrpBadVersion:          0    vrrpBadVrid:            0
vrrpBadAddress:          0    vrrpBadData:            0
vrrpBadPassword:         0    vrrpBadInterval:        0
```

Table 97   VRRP Statistics

Statistics	Description
vrrpInAdvers	The total number of valid VRRP advertisements that have been received.
vrrpBadAdvers	The total number of VRRP advertisements received that were dropped.
vrrpOutAdvers	The total number of VRRP advertisements that have been sent.
vrrpBadVersion	The total number of VRRP advertisements received that had a bad version number.
vrrpBadVrid	The total number of VRRP advertisements received that had a bad virtual router ID.
vrrpBadAddress	The total number of VRRP advertisements received that had a bad address.
vrrpBadData	The total number of VRRP advertisements received that had bad data.
vrrpBadPassword	The total number of VRRP advertisements received that had a bad password.
vrrpBadInterval	The total number of VRRP advertisements received that had a bad interval.

/stats/l3/rip
Routing Information Protocol Statistics

```
RIP ALL STATS INFORMATION:
        RIP packets received  = 12
        RIP packets sent      = 75
        RIP request received  = 0
        RIP response recevied = 12
        RIP request sent      = 3
        RIP reponse sent      = 72
        RIP route timeout     = 0
        RIP bad size packet received = 0
        RIP bad version received       = 0
        RIP bad zeros received         = 0
        RIP bad src port received      = 0
        RIP bad src IP received        = 0
        RIP packets from self received = 0
```

/stats/mp
Management Processor Statistics Menu

```
[MP-specific Statistics Menu]
    thr      - Show STEM thread stats
    i2c      - Show I2C stats
    pkt      - Show Packet stats
    tcb      - Show All TCP control blocks in use
    ucb      - Show All UDP control blocks in use
    cpu      - Show CPU utilization
    mem      - Show Memory utilization stats
```

Table 98 Management Processor Statistics Menu Options

Command Syntax and Usage

thr

Displays STEM thread statistics. This command is used by Technical Support personnel.

i2c

Displays I2C statistics. This command is used by Technical Support personnel.

pkt

Displays packet statistics, to check for leads and load. To view a sample output and a description of the stats, see page 205.

tcb

Displays all TCP control blocks that are in use. To view a sample output and a description of the stats, see page 208.

ucb

Displays all UDP control blocks that are in use. To view a sample output, see page 208.

cpu

Displays CPU utilization for periods of up to 1, 4, and 64 seconds. To view a sample output and a description of the stats, see page 209.

mem

Displays system memory statistics.

/stats/mp/pkt
MP Packet Statistics

```
CPU packet statistics at 16:57:24 Sat Apr  5, 2010

Packets received by CPU:
------------------------
Total packets:          7642 (7642 since bootup)
BPDUs:                  5599
Cisco packets:             0
ARP packets:            1732
IPv4 packets:            113
IPv6 packets:              0
LLDP PDUs:               198
Other:                     0

Packet Buffer Statistics:
-------------------------
allocs:         14311
frees:          14311
failures:           0
dropped:            0

small packet buffers:
---------------------
  current:               0
  hi-watermark:          1
  hi-water time:  14:59:46 Sat Apr  5, 2010

medium packet buffers:
----------------------
  current:               0
  hi-watermark:          1
  hi-water time:  14:59:49 Sat Apr  5, 2010

jumbo packet buffers:
---------------------
  current:               0
  hi-watermark:          0
```

Table 99 Packet Statistics

Statistics	Description
Packets received by CPU	
Total packets	Total number of packets received
BPDUs	Total number of spanning-tree Bridge Protocol Data Units received.
Cisco packets	Total number of UniDirectional Link Detection (UDLD) packets and Cisco Discovery Protocol (CDP) packets received.
ARP packets	Total number of Address Resolution Protocol packets received.
IPv4 packets	Total number of IPv4 packets received.
IPv6 packets	Total number of IPv6 packets received.
LLDP PDUs	Total number of Link Layer Discovery Protocol data units received.
Other	Total number of other packets received.
Packet Buffer Statistics	
allocs	Total number of packet allocations from the packet buffer pool by the TCP/IP protocol stack.
frees	Total number of times the packet buffers are freed (released) to the packet buffer pool by the TCP/IP protocol stack.
failures	Total number of packet allocation failures from the packet buffer pool by the TCP/IP protocol stack.
small packet buffers	
current	Total number of packet allocations with size less than 128 bytes from the packet buffer pool by the TCP/IP protocol stack.
hi-watermark	The highest number of packet allocation with size less than 128 bytes from the packet buffer pool by the TCP/IP protocol stack.
hi-water time	Time stamp that indicates when the hi-watermark was reached.
medium packet buffers	
current	Total number of packet allocations with size between 128 to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.

Table 99 Packet Statistics

Statistics	Description
hi-watermark	The highest number of packet allocation with size between 128 to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
hi-water time	Time stamp that indicates when the hi-watermark was reached.
jumbo packet buffers	
current	Total number of packet allocations with more than 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
hi-watermark	The highest number of packet allocation with more than 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.

`/stats/mp/tcb`
TCP Statistics

```
All TCP allocated control blocks:
10ad41e8:  0.0.0.0               0 <=> 0.0.0.0            80  listen
10ad5790:  47.81.27.5        1171 <=> 47.80.23.243       23  established
```

Table 100   MP Specified TCP Statistics

Statistics	Description
10ad41e8/10ad5790	Memory
0.0.0.0/47.81.27.5	Destination IP address
0/1171	Destination port
0.0.0.0/47.80.23.243	Source IP
80/23	Source port
listen/established	State

`/stats/mp/ucb`
UCB Statistics

```
All UDP allocated control blocks:
   161:  listen
```

/stats/mp/cpu
CPU Statistics

This option displays the CPU utilization statistics.

```
CPU utilization:
cpuUtil1Second:          53%
cpuUtil4Seconds:         54%
cpuUtil64Seconds:        54%
```

Table 101 CPU Statistics

Statistics	Description
cpuUtil1Second	The utilization of MP CPU over 1 second. It shows the percentage.
cpuUtil4Seconds	The utilization of MP CPU over 4 seconds. It shows the percentage.
cpuUtil64Seconds	The utilization of MP CPU over 64 seconds. It shows the percentage.

/stats/acl
ACL Statistics Menu

```
[ACL Menu]
     acl      - Display ACL stats
     acl6     - Display IPv6 ACL stats
     dump     - Display all available ACL stats
     vmap     - Display VMAP stats
     clracl   - Clear ACL stats
     clracl6  - Clear IPv6 ACL stats
     clrvmap  - Clear VMAP stats
```

ACL statistics are described in the following table.

Table 102   ACL Statistics Menu Options

Command Syntax and Usage

acl *<ACL number>*

Displays the Access Control List Statistics for a specific ACL. For details, see page 211.

acl6 *<ACL number>*

Displays the IPv6 Access Control List Statistics for a specific ACL.

dump

Displays all ACL statistics.

vmap *<VMAP number>*

Displays the VLAN Map statistics for a specific VMAP. For details, see page 211.

clracl

Clears all ACL statistics.

clracl6

Clears all IPv6 ACL statistics.

clrvmap

Clears all VMAP statistics.

/stats/acl/acl [*<ACL number>*]
ACL Statistics

This option displays statistics for the selected ACL if an ACL number is specified, or for all ACLs if the option is omitted.

```
Hits for ACL 1:                26057515
Hits for ACL 2:                26057497
```

/stats/acl/vmap [*<VMAP number>*|all]
VLAN Map Statistics

This option displays statistics for the selected VLAN Map, or for all VMAPs.

```
Hits for VMAP 1:               57515
Hits for VMAP 2:               74970
```

/stats/snmp [clear]
SNMP Statistics

Note – You can reset the SNMP counter to zero by using `clear` command, as follows:
>> Statistics# **snmp clear**

```
SNMP statistics:
snmpInPkts:             150097    snmpInBadVersions:             0
snmpInBadC'tyNames:          0    snmpInBadC'tyUses:             0
snmpInASNParseErrs:          0    snmpEnableAuthTraps:           0
snmpOutPkts:            150097    snmpInBadTypes:                0
snmpInTooBigs:               0    snmpInNoSuchNames:             0
snmpInBadValues:             0    snmpInReadOnlys:               0
snmpInGenErrs:               0    snmpInTotalReqVars:       798464
snmpInTotalSetVars:       2731    snmpInGetRequests:         17593
snmpInGetNexts:         131389    snmpInSetRequests:           615
snmpInGetResponses:          0    snmpInTraps:                   0
snmpOutTooBigs:              0    snmpOutNoSuchNames:            1
snmpOutBadValues:            0    snmpOutReadOnlys:              0
snmpOutGenErrs:              1    snmpOutGetRequests:            0
snmpOutGetNexts:             0    snmpOutSetRequests:            0
snmpOutGetResponses:    150093    snmpOutTraps:                  4
snmpSilentDrops:             0    snmpProxyDrops:                0
```

Table 103 SNMP Statistics

Statistics	Description
snmpInPkts	The total number of Messages delivered to the SNMP entity from the transport service.
snmpInBadVersions	The total number of SNMP Messages, which were delivered to the SNMP protocol entity and were for an unsupported SNMP version.
snmpInBadC'tyNames	The total number of SNMP Messages delivered to the SNMP entity which used an SNMP community name not known to the said entity (the switch).
snmpInBadC'tyUses	The total number of SNMP Messages delivered to the SNMP protocol entity which represented an SNMP operation which was not allowed by the SNMP community named in the Message.

Table 103 SNMP Statistics

Statistics	Description
snmpInASNParseErrs	The total number of ASN.1 or BER errors encountered by the SNMP protocol entity when decoding SNMP Messages received. **Note:** OSI's method of specifying abstract objects is called ASN.1 (Abstract Syntax Notation One, defined in X.208), and one set of rules for representing such objects as strings of ones and zeros is called the BER (Basic Encoding Rules, defined in X.209). ASN.1 is a flexible notation that allows one to define a variety of data types, from simple types such as integers and bit strings to structured types such as sets and sequences. BER describes how to represent or encode values of each ASN.1 type as a string of eight-bit octets.
snmpEnableAuth Traps	An object to enable or disable the authentication traps generated by this entity (the switch).
snmpOutPkts	The total number of SNMP Messages which were passed from the SNMP protocol entity to the transport service.
snmpInBadTypes	The total number of SNMP Messages which failed ASN parsing.
snmpInTooBigs	The total number of SNMP Protocol Data Units (PDUs) which were delivered to the SNMP protocol entity and for which the value of the error-status field is *too big*.
snmpInNoSuchNames	The total number of SNMP Protocol Data Units (PDUs) which were delivered to the SNMP protocol entity and for which the value of the error-status field is `noSuchName`.
snmpInBadValues	The total number of SNMP Protocol Data Units (PDUs) which were delivered to the SNMP protocol entity and for which the value of the error-status field is `badValue`.
snmpInReadOnlys	The total number of valid SNMP Protocol Data Units (PDUs), which were delivered to the SNMP protocol entity and for which the value of the error-status field is `read-Only'. It should be noted that it is a protocol error to generate an SNMP PDU, which contains the value `read-Only' in the error-status field. As such, this object is provided as a means of detecting incorrect implementations of the SNMP.
snmpInGenErrs	The total number of SNMP Protocol Data Units (PDUs), which were delivered to the SNMP protocol entity and for which the value of the error-status field is `genErr`.

Table 103 SNMP Statistics

Statistics	Description
snmpInTotalReqVars	The total number of MIB objects which have been retrieved successfully by the SNMP protocol entity as a result of receiving valid SNMP Get-Request and Get-Next Protocol Data Units (PDUs).
snmpInTotalSetVars	The total number of MIB objects, which have been altered successfully by the SNMP protocol entity as a result of receiving valid SNMP Set-Request Protocol Data Units (PDUs).
snmpInGetRequests	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInGetNexts	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInSetRequests	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInGetResponses	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInTraps	The total number of SNMP Trap Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpOutTooBigs	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is *too big*.
snmpOutNoSuchNames	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status is `noSuchName.`
snmpOutBadValues	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is `badValue.`
snmpOutReadOnlys	Not in use.
snmpOutGenErrs	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is `genErr.`
snmpOutGetRequests	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.

Table 103 SNMP Statistics

Statistics	Description
snmpOutGetNexts	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutSetRequests	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutGet Responses	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutTraps	The total number of SNMP Trap Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpSilentDrops	The total number of `GetRequest`-PDUs, `GetNextRequest`-PDUs, `GetBulkRequest`-PDUs, `SetRequest`-PDUs, and `InformRequest`-PDUs delivered to the SNMPv2 entity which were silently dropped because the size of a reply containing an alternate Response-PDU with an empty variable bindings field was greater than either a local constraint or the maximum message size associated with the originator of the request.
snmpProxyDrops	The total number of `GetRequest`-PDUs, `GetNextRequest`-PDUs, `GetBulkRequest`-PDUs, `SetRequest`-PDUs, and `InformRequest`-PDUs delivered to the SNMP entity which were silently dropped because the transmission of the message to a proxy target failed in a manner such that no Response-PDU could be returned.

/stats/ntp
NTP Statistics

BLADEOS uses NTP (Network Timing Protocol) version 3 to synchronize the switch's internal clock with an atomic time calibrated NTP server. With NTP enabled, the switch can accurately update its internal clock to be consistent with other devices on the network and generates accurate syslogs.

```
NTP statistics:
        Primary Server:
                Requests Sent:             17
                Responses Received:        17
                Updates:                   1
        Secondary Server:
                Requests Sent:             0
                Responses Received:        0
                Updates:                   0

        Last update based on response from primary/secondary server.
        Last update time: 18:04:16 Tue Jul 13, 2009
        Current system time: 18:55:49 Tue Jul 13, 2009
```

Table 104 NTP Statistics

Field	Description
Primary Server	■ **Requests Sent:** The total number of NTP requests the switch sent to the primary NTP server to synchronize time. ■ **Responses Received:** The total number of NTP responses received from the primary NTP server. ■ **Updates:** The total number of times the switch updated its time based on the NTP responses received from the primary NTP server.
Secondary Server	■ **Requests Sent:** The total number of NTP requests the switch sent to the secondary NTP server to synchronize time. ■ **Responses Received:** The total number of NTP responses received from the secondary NTP server. ■ **Updates:** The total number of times the switch updated its time based on the NTP responses received from the secondary NTP server.

Table 104 NTP Statistics

Field	Description
Last update based on response from primary server	Last update of time on the switch based on either primary or secondary NTP response received.
Last update time	The time stamp showing the time when the switch was last updated.
Current system time	The switch system time when the following command was issued: `/stats/ntp`

Note – Use the following command to delete all NTP statistics: `/stats/ntp clear`

`/stats/dump`
Statistics Dump

Use the dump command to dump all switch statistics available from the Statistics menu (40K or more, depending on your configuration). This data can be used to tune or debug switch performance.

If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

CHAPTER 6
The Configuration Menu

This chapter discusses how to use the Command Line Interface (CLI) for making, viewing, and saving switch configuration changes. Many of the commands, although not new, display more or different information than in the previous version. Important differences are called out in the text.

/cfg
Configuration Menu

```
[Configuration Menu]
     sys      - System-wide Parameter Menu
     port     - Port Menu
     stack    - Stacking Menu
     qos      - QOS Menu
     acl      - Access Control List Menu
     pmirr    - Port Mirroring Menu
     l2       - Layer 2 Menu
     l3       - Layer 3 Menu
     rmon     - RMON Menu
     virt     - Virtualization Menu
     setup    - Step by step configuration set up
     dump     - Dump current configuration to script file
     ptcfg    - Backup current configuration to FTP/TFTP server
     gtcfg    - Restore current configuration from FTP/TFTP server
     cur      - Display current configuration
```

Each configuration option is briefly described in Table 105, with pointers to detailed menu commands.

Table 105 Configuration Menu Options

Command Syntax and Usage

sys

Displays the System Configuration menu. To view menu options, see page 223.

port *<port alias or number>*

Displays the Port Configuration menu. To view menu options, see page 264.

stack

Displays the Stacking Configuration Menu. This menu is visible only if stacking is enabled from the /boot menu, and the switch is reset. To view menu options, see page 273.

qos

Displays the Quality of Service Configuration menu. To view menu options, see page 275.

acl

Displays the ACL Configuration menu. To view menu options, see page 278.

pmirr

Displays the Mirroring Configuration menu. To view menu options, see page 297.

l2

Displays the Layer 2 Configuration menu. To view menu options, see page 299.

l3

Displays the Layer 3 Configuration menu. To view menu options, see page 349.

rmon

Displays the Remote Monitoring (RMON) Configuration Menu. To view menu options, see page 443.

virt

Displays the Virtualization Configuration Menu. To view menu options, see page 448.

setup

Step-by-step configuration set-up of the switch. For details, see page 456.

Table 105   Configuration Menu Options   (continued)

Command Syntax and Usage

dump

> Dumps current configuration to a script file. For details, see page 456.

ptcfg *<FTP/TFTP server host name or IP address>* *<filename on host>*

> Backs up current configuration to FTP/TFTP server. For details, see page 456.

gtcfg *<host name or IP address of FTP/TFTP server>* *<filename on host>*

> Restores current configuration from FTP/TFTP server. For details, see page 457.

cur

> Displays current configuration parameters.

Viewing, Applying, and Saving Changes

As you use the configuration menus to set switch parameters, the changes you make do not take effect immediately. All changes are considered "pending" until you explicitly apply them. Also, any changes are lost the next time the switch boots unless the changes are explicitly saved.

Note – Some operations can override the settings in the Configuration menu. Therefore, settings you view in the Configuration menu (for example, port status) might differ from run-time information that you view in the Information menu. The Information menu displays current run-time information of switch parameters.

While configuration changes are in the pending state, you can do the following:

■ View the pending changes

■ Apply the pending changes

■ Save the changes to flash memory

Viewing Pending Changes

You can view all pending configuration changes by entering **diff** at the menu prompt.

Note – The diff command is a global command. Therefore, you can enter **diff** at any prompt in the CLI.

Applying Pending Changes

To make your configuration changes active, you must apply them. To apply configuration changes, enter **apply** at any prompt in the CLI.

```
# apply
```

Note – The apply command is a global command. Therefore, you can enter **apply** at any prompt in the administrative interface.

Saving the Configuration

In addition to applying the configuration changes, you can save them to flash memory on the RackSwitch G8000 (G8000).

Note – If you do not save the changes, they will be lost the next time the system is rebooted.

To save the new configuration, enter the following command at any CLI prompt:

```
# save
```

When you save configuration changes, the changes are saved to the *active* configuration block. The configuration being replaced by the save is first copied to the *backup* configuration block. If you do not want the previous configuration block copied to the backup configuration block, enter the following instead:

```
# save n
```

You can decide which configuration you want to run the next time you reset the switch. Your options include:

- The active configuration block
- The backup configuration block
- Factory default configuration

You can view all pending configuration changes that have been applied but not saved to flash memory using the diff flash command. It is a global command that can be executed from any menu.

For instructions on selecting the configuration to run at the next system reset, see "Selecting a Configuration Block" on page 478.

/cfg/sys
System Configuration Menu

```
[System Menu]
     errdis   - ErrDisable Menu
     syslog   - Syslog Menu
     sshd     - SSH Server Menu
     radius   - RADIUS Authentication Menu
     tacacs+  - TACACS+ Authentication Menu
     ldap     - LDAP Authentication Menu
     ntp      - NTP Server Menu
     ssnmp    - System SNMP Menu
     access   - System Access Menu
     dst      - Custom DST Menu
     sflow    - sFlow Menu
     srvports - Server ports Menu
     date     - Set system date
     time     - Set system time
     timezone - Set system timezone (daylight savings)
     dlight   - Set system daylight savings
     idle     - Set timeout for idle CLI sessions
     linkscan - Set linkscan mode
     notice   - Set login notice
     bannr    - Set login banner
     hprompt  - Enable/disable display hostname (sysName) in CLI prompt
     dhcp     - Enable/disable use of DHCP on interface 1
     reminder - Enable/disable Reminders
     rstctrl  - Enable/disable System reset on panic
     pktlog   - Enable/disable CPU packet logging capability
     cur      - Display current system-wide parameters
```

This menu provides configuration of switch management parameters such as user and administrator privilege mode passwords, Web-based management settings, and management access lists.

Table 106   System Configuration Menu Options

Command Syntax and Usage

errdis

Displays the Error Disable Recovery menu. To view menu options, see page 227.

syslog

Displays the Syslog menu. To view menu options, see page 228.

sshd

Displays the SSH Server menu. To view menu options, see page 229.

Table 106 System Configuration Menu Options

Command Syntax and Usage

radius

Displays the RADIUS Authentication menu. To view menu options, see page 231.

tacacs+

Displays the TACACS+ Authentication menu. To view menu options, see page 233.

ldap

Displays the LDAP Authentication menu. To view menu options, see page 236.

ntp

Displays the Network Time Protocol (NTP) Server menu. To view menu options, see page 238.

ssnmp

Displays the System SNMP menu. To view menu options, see page 239.

access

Displays the System Access menu. To view menu options, see page 252.

dst

Displays the Custom Daylight Savings Time menu. To view menu options, see page 260.

sflow

Displays the sFlow menu. To view menu options, see page 261.

srvports

Displays the SRV ports menu. To view menu options, see page 263.

date

Prompts the user for the system date. The date retains its value when the switch is reset.

time

Configures the system time using a 24-hour clock format. The time retains its value when the switch is reset.

timezone

Configures the time zone where the switch resides. You are prompted to select your location (continent, country, region) by the timezone wizard. Once a region is selected, the switch updates the time to reflect local changes to Daylight Savings Time, etc.

Table 106 System Configuration Menu Options

Command Syntax and Usage

dlight enable|disable

Disables or enables daylight savings time in the system clock. When enabled, the switch will add an extra hour to the system clock so that it is consistent with the local clock.

The default value is **disabled**.

idle *<idle timeout in minutes>*

Sets the idle timeout for CLI sessions, from 1 to 60 minutes. The default is 10 minutes.

linkscan {fast|normal|slow}

Configures the link scan interval used to poll the status of ports.

notice *<maximum 1024 character multi-line login notice>* *<'.' to end>*

Displays login notice immediately before the "Enter password:" prompt. This notice can contain up to 1024 characters and new lines.

bannr *<string, maximum 80 characters>*

Configures a login banner of up to 80 characters. When a user or administrator logs into the switch, the login banner is displayed. It is also displayed as part of the output from the /info/sys command.

hprompt disable|enable

Enables or disables displaying of the host name (system administrator's name) in the Command Line Interface (CLI).

dhcp disable|enable

Enables or disables Dynamic Host Control Protocol for setting the IP address on interface 1. When enabled, the IP address obtained from the DHCP server overrides the static IP address. The default setting is enabled.

reminder disable|enable

Enables or disables reminder messages in the CLI. The default value is enabled.

rstctrl disable|enable

Enables or disables the reset control flag. When enabled, the switch continues to function after a crash of the main processor, using the last known Layer 2/3 information. The default setting is enabled.

Table 106 System Configuration Menu Options

Command Syntax and Usage

pktlog disable|enable

Enables or disables logging of packets that come to the CPU. The default setting is `enabled`.

cur

Displays the current system parameters.

/cfg/sys/errdis
Error Disable Configuration

```
[System ErrDisable Menu]
     timeout  - Set ErrDisable timeout (sec)
     ena      - Enable ErrDisable recovery
     dis      - Disable ErrDisable recovery
     cur      - Display current ErrDisable configuration
```

The Error Disable and Recovery feature allows the switch to automatically disable a port if an error condition is detected on the port. The port remains in the error-disabled state until it is re-enabled manually, or re-enabled automatically by the switch after a timeout period has elapsed. The error-disabled state of a port does not persist across a system reboot.

Table 107 Error Disable Configuration Options

Command Syntax and Usage

timeout *<30 - 86400>*

Configures the error-recovery timeout, in seconds. After the timer expires, the switch attempts to re-enable the port. The default value is 300.

Note: When you change the timeout value, all current error-recovery timers are reset.

ena

Globally enables automatic error-recovery for error-disabled ports. The default setting is `disabled`.

Note: Each port must have error-recovery enabled to participate in automatic error recovery (**/cfg/port** *x***/errdis/ena**).

dis

Globally disables error-recovery for error-disabled ports.

cur

Displays the current system Error Disable and Recovery configuration.

/cfg/sys/syslog
System Host Log Configuration

```
[Syslog Menu]
     host      - Set IP address of first syslog host
     host2     - Set IP address of second syslog host
     sever     - Set the severity of first syslog host
     sever2    - Set the severity of second syslog host
     facil     - Set facility of first syslog host
     facil2    - Set facility of second syslog host
     console   - Enable/disable console output of syslog messages
     log       - Enable/disable syslogging of features
     cur       - Display current syslog settings
```

Table 108 System Host Log Options

Command Syntax and Usage

host *<new syslog host IP address>*

Sets the IP address of the first syslog host.

host2 *<new syslog host IP address>*

Sets the IP address of the second syslog host.

sever *<syslog host local severity (0–7)>*

This option sets the severity level of the first syslog host displayed. The default is 7, which means log all severity levels.

sever2 *<syslog host local severity (0–7)>*

This option sets the severity level of the second syslog host displayed. The default is 7, which means, log all severity levels.

facil *<syslog host local facility (0-7)>*

This option sets the facility level of the first syslog host displayed. The default is 0.

facil2 *<syslog host local facility (0-7)>*

This option sets the facility level of the second syslog host displayed. The default is 0.

console disable|**enable**

Enables or disables delivering syslog messages to the console. When necessary, disabling console ensures the switch is not affected by syslog messages. It is enabled by default.

Table 108   System Host Log Options

Command Syntax and Usage

log <*feature*|**all**> <**enable**|**disable**>

Displays a list of features for which syslog messages can be generated. You can choose to enable or disable specific features (such as vlans, stg, or ssh), or to enable or disable syslog on all available features.

cur

Displays the current syslog settings.

/cfg/sys/sshd
SSH Server Configuration

```
[SSHD Menu]
     intrval  - Set Interval for generating the RSA server key
     scpadm   - Set SCP-only admin password
     hkeygen  - Generate the RSA host key
     skeygen  - Generate the RSA server key
     sshport  - Set SSH server port number
     ena      - Enable the SCP apply and save
     dis      - Disable the SCP apply and save
     on       - Turn SSH server ON
     off      - Turn SSH server OFF
     cur      - Display current SSH server configuration
```

This menu enables Secure Shell access from any SSH client. SSH scripts can be viewed by using the /cfg/dump command (see).

Table 109   SSH Configuration Options

Command Syntax and Usage

intrval <*0 - 24*>

Set the interval, in hours, for auto-generation of the RSA server key.

scpadm

Set the administration password for SCP access.

hkeygen

Generate the RSA host key.

skeygen

Generate the RSA server key.

Table 109   SSH Configuration Options

Command Syntax and Usage
sshport *<TCP port number>*   Sets the SSH server port number.
ena   Enables the SCP apply and save.
dis   Disables the SCP apply and save.
on   Enables the SSH server.
off   Disables the SSH server.
cur   Displays the current SSH server configuration.

`/cfg/sys/radius`
RADIUS Server Configuration

```
[RADIUS Server Menu]
    prisrv  - Set primary RADIUS server address
    secsrv  - Set secondary RADIUS server address
    secret  - Set RADIUS secret
    secret2 - Set secondary RADIUS server secret
    port    - Set RADIUS port
    retries - Set RADIUS server retries
    timeout - Set RADIUS server timeout
    bckdoor - Enable/disable RADIUS backdoor for telnet/ssh/http/https
    secbd   - Enable/disable RADIUS secure backdoor for
               telnet/ssh/http/https
    on      - Turn RADIUS authentication ON
    off     - Turn RADIUS authentication OFF
    cur     - Display current RADIUS configuration
```

Table 110 RADIUS Server Configuration Options

Command Syntax and Usage

prisrv *<IP address>*

Sets the primary RADIUS server address.

secsrv *<IP address>*

Sets the secondary RADIUS server address.

secret *<1-32 character secret>*

This is the shared secret between the switch and the RADIUS server(s).

secret2 *<1-32 character secret>*

This is the secondary shared secret between the switch and the RADIUS server(s).

port *<RADIUS port>*

Enter the number of the UDP port to be configured, between 1500 - 3000. The default is 1645.

retries *<RADIUS server retries (1-3)>*

Sets the number of failed authentication requests before switching to a different RADIUS server. The default is 3 requests.

timeout *<RADIUS server timeout seconds (1-10)>*

Sets the amount of time, in seconds, before a RADIUS server authentication attempt is considered to have failed. The default is 3 seconds.

Table 110 RADIUS Server Configuration Options

Command Syntax and Usage

bckdoor disable|enable

Enables or disables the RADIUS backdoor for Telnet/SSH/HTTP/HTTPS. The default value is disabled.

To obtain the RADIUS backdoor password for your switch, contact your Service and Support line.

secbd enable|disable

Enables or disables the RADIUS back door using secure password for telnet/SSH/HTTP/HTTPS. This command does not apply when backdoor (telnet) is enabled.

on

Enables the RADIUS server.

off

Disables the RADIUS server.

cur

Displays the current RADIUS server parameters.

`/cfg/sys/tacacs+`
TACACS+ Server Configuration

TACACS (Terminal Access Controller Access Control system) is an authentication protocol that allows a remote access server to forward a user's logon password to an authentication server to determine whether access can be allowed to a given system. TACACS is not an encryption protocol, and therefore less secure than TACACS+ and Remote Authentication Dial-In User Service (RADIUS) protocols. Both TACACS and TACACS+ are described in RFC 1492.

TACACS+ protocol is more reliable than RADIUS, as TACACS+ uses the Transmission Control Protocol (TCP) whereas RADIUS uses the User Datagram Protocol (UDP). Also, RADIUS combines authentication and authorization in a user profile, whereas TACACS+ separates the two operations.

TACACS+ offers the following advantages over RADIUS as the authentication device:

- TACACS+ is TCP-based, so it facilitates connection-oriented traffic.

- It supports full-packet encryption, as opposed to password-only in authentication requests.

- It supports de-coupled authentication, authorization, and accounting.

```
[TACACS+ Server Menu]
    prisrv   - Set IP address of primary TACACS+ server
    secsrv   - Set IP address of secondary TACACS+ server
    chpass_p - Set new password for primary server
    chpass_s - Set new password for secondary server
    secret   - Set secret for primary TACACS+ server
    secret2  - Set secret for secondary TACACS+ server
    port     - Set TACACS+ port number
    retries  - Set number of TACACS+ server retries
    attempts - Set number of TACACS+ login attempts
    timeout  - Set timeout value of TACACS+ server retries
    usermap  - Set user privilege mappings
   bckdoor   - Enable/disable TACACS+ backdoor for telnet/ssh/http/hhtps
    secbd    - Enable/disable TACACS+ secure backdoor
    cmap     - Enable/disable TACACS+ new privilege level mapping
    passch   - Enable/disable TACACS+ password change
    cauth    - Enable/disable TACACS+ command authorization
    clog     - Enable/disable TACACS+ command logging
    on       - Enable TACACS+ authentication
    off      - Disable TACACS+ authentication
    cur      - Display current TACACS+ settings
```

Table 111 TACACS+ Server Configuration Options

Command Syntax and Usage

prisrv *<IP address>*

Defines the primary TACACS+ server address.

secsrv *<IP address>*

Defines the secondary TACACS+ server address.

chpass_p

Configures the password for the primary TACACS+ server. The CLI will prompt you for input.

chpass_s

Configures the password for the secondary TACACS+ server. The CLI will prompt you for input.

secret *<1-32 character secret>*

This is the shared secret between the switch and the TACACS+ server(s).

secret2 *<1-32 character secret>*

This is the secondary shared secret between the switch and the TACACS+ server(s).

port *<TACACS port>*

Enter the number of the TCP port to be configured, between 1 - 65000. The default is 49.

retries *<TACACS server retries, 1-3>*

Sets the number of failed authentication requests before switching to a different TACACS+ server. The default is 3 requests.

attempts *<1-10>*

Sets the number of failed login attempts before disconnecting the user. The default is 2 attempts.

timeout *<TACACS server timeout seconds, 4-15>*

Sets the amount of time, in seconds, before a TACACS+ server authentication attempt is considered to have failed. The default is 5 seconds.

usermap *<0-15>* **user|oper|admin|none**

Maps a TACACS+ authorization level to a switch user level. Enter a TACACS+ authorization level (0-15), followed by the corresponding switch user level.

Table 111   TACACS+ Server Configuration Options

Command Syntax and Usage

bckdoor disable|enable

Enables or disables the TACACS+ back door for Telnet, SSH/SCP, or HTTP/HTTPS.

Enabling this feature allows you to bypass the TACACS+ servers. It is recommended that you use Secure Backdoor to ensure the switch is secured, because Secure Backdoor disallows access through the back door when the TACACS+ servers are responding.

The default setting is `disabled`.

To obtain the TACACS+ backdoor password for your switch, contact your Service and Support line.

secbd enable|disable

Enables or disables TACACS+ secure back door access through Telnet, SSH/SCP, or HTTP/HTTPS only when the TACACS+ servers are not responding.

This feature is recommended to permit access to the switch when the TACACS+ servers become unresponsive. If no back door is enabled, the only way to gain access when TACACS+ servers are unresponsive is to use the back door via the console port.

The default setting is `disabled`.

cmap enable|disable

Enables or disables TACACS+ privilege-level mapping.

The default value is `disabled`.

passch enable|disable

Enables or disables TACACS+ password change.

The default setting is `disabled`.

cauth disable|enable

Enables or disables TACACS+ command authorization.

clog disable|enable

Enables or disables TACACS+ command logging.

on

Enables the TACACS+ server. This is the default setting.

Table 111 TACACS+ Server Configuration Options

Command Syntax and Usage

off

Disables the TACACS+ server.

cur

Displays current TACACS+ configuration parameters.

/cfg/sys/ldap
LDAP Server Configuration

LDAP (Lightweight Directory Access Protocol) is an authentication protocol that allows a remote access server to forward a user's logon password to an authentication server to determine whether access can be allowed to a given system.

```
[LDAP Server Menu]
     prisrv   - Set IP address of primary LDAP server
     secsrv   - Set IP address of secondary LDAP server
     port     - Set LDAP port number
     retries  - Set number of LDAP server retries
     timeout  - Set timeout value of LDAP server retries
     domain   - Set domain name
     bckdoor  - Enable/disable LDAP backdoor for telnet/ssh/http/https
     on       - Enable LDAP authentication
     off      - Disable LDAP authentication
     cur      - Display current LDAP settings
```

Table 112 LDAP Server Configuration Options

Command Syntax and Usage

prisrv *<IP address>*

Defines the primary LDAP server address.

secsrv *<IP address>*

Defines the secondary LDAP server address.

port *<LDAP port>*

Enter the number of the TCP port to be configured, between 1 - 65000. The default is 389.

Table 112 LDAP Server Configuration Options

retries *<LDAP server retries, 1-3>*

Sets the number of failed authentication requests before switching to a different LDAP server. The default is 3 requests.

timeout *<LDAP server timeout seconds, 4-15>*

Sets the amount of time, in seconds, before a LDAP server authentication attempt is considered to have failed. The default is 5 seconds.

domain *<domain name (1-128 characters)>*|**none**

Sets the domain name for the LDAP server. Enter the full path for your organization. For example:

```
ou=people,dc=mydomain,dc=com
```

bckdoor disable|**enable**

Enables or disables the LDAP back door for Telnet, SSH/SCP, or HTTP/HTTPS. The default setting is `disabled`.

To obtain the LDAP back door password for your G8000, contact your Service and Support line.

on

Enables the LDAP server.

off

Disables the LDAP server. This is the default setting.

cur

Displays current LDAP configuration parameters.

/cfg/sys/ntp
NTP Server Configuration

```
[NTP Server Menu]
      prisrv  - Set primary NTP server hostname|IP address
      secsrv  - Set secondary NTP server hostname|IP address
      intrval - Set NTP server resync interval
      on      - Turn NTP service ON
      off     - Turn NTP service OFF
      cur     - Display current NTP configuration
```

This menu enables you to synchronize the switch clock to a Network Time Protocol (NTP) server. By default, this option is disabled.

Table 113   NTP Configuration Configuration Options

Command Syntax and Usage

prisrv {<*host name*>|<*IP address*>}

Prompts for the hostname or IP addresses of the primary NTP server to which you want to synchronize the switch clock.

secsrv {<*host name*>|<*IP address*>}

Prompts for the hostname or IP addresses of the secondary NTP server to which you want to synchronize the switch clock.

intrval <*5-44640*>

Specifies the time interval, in minutes, to re-synchronize the switch clock with the NTP server. The default value is 1440.

on

Enables the NTP synchronization service.

off

Disables the NTP synchronization service.

cur

Displays the current NTP service settings.

/cfg/sys/ssnmp
System SNMP Configuration

```
[System SNMP Menu]
    snmpv3   - SNMPv3 Menu
    name     - Set SNMP "sysName"
    locn     - Set SNMP "sysLocation"
    cont     - Set SNMP "sysContact"
    rcomm    - Set SNMP read community string
    wcomm    - Set SNMP write community string
    trsrc    - Set SNMP trap source interface for SNMPv1
    timeout  - Set timeout for the SNMP state machine
    auth     - Enable/disable SNMP "sysAuthenTrap"
    linkt    - Enable/disable SNMP link up/down trap
    cur      - Display current SNMP configuration
```

BLADEOS supports SNMP-based network management. In SNMP model of network management, a management station (client/manager) accesses a set of variables known as MIBs (Management Information Base) provided by the managed device (agent). If you are running an SNMP network management station on your network, you can manage the switch using the following standard SNMP MIBs:

- MIB II (RFC 1213)
- Ethernet MIB (RFC 1643)
- Bridge MIB (RFC 1493)

An SNMP agent is a software process on the managed device that listens on UDP port 161 for SNMP messages. Each SNMP message sent to the agent contains a list of management objects to retrieve or to modify.

SNMP parameters that can be modified include:

- System name
- System location
- System contact
- Use of the SNMP system authentication trap function
- Read community string
- Write community string
- Trap community strings

Table 114   System SNMP Options

Command Syntax and Usage

snmpv3

Displays SNMPv3 menu. To view menu options, see .

name *<1-64 characters>*

Configures the name for the system.

locn *<1-64 characters>*

Configures the name of the system location.

cont *<1-64 characters>*

Configures the name of the system contact.

rcomm *<1-32 characters>*

Configures the SNMP read community string. The read community string controls SNMP "get" access to the switch. The default read community string is *public*.

wcomm *<1-32 characters>*

Configures the SNMP write community string. The write community string controls SNMP "set" and "get" access to the switch. The default write community string is *private*.

trsrc *<interface number>*

Configures the source interface for SNMP traps. The default value is interface 1.

timeout *<1-30>*

Set the timeout value for the SNMP state machine, in minutes.

auth disable|**enable**

Enables or disables the use of the system authentication trap facility. The default setting is `disabled`.

linkt *<port>* {**disable**|**enable**}

Enables or disables the sending of SNMP link up and link down traps. The default setting is `enabled`.

cur

Displays the current SNMP configuration.

`/cfg/sys/ssnmp/snmpv3`
SNMPv3 Configuration

SNMP version 3 (SNMPv3) is an extensible SNMP Framework that supplements the SNMPv2 Framework by supporting the following:

- a new SNMP message format

- security for messages

- access control

- remote configuration of SNMP parameters

For more details on the SNMPv3 architecture please refer to RFC3411 to RFC3418.

```
[SNMPv3 Menu]
     usm      - usmUser Table menu
     view     - vacmViewTreeFamily Table menu
     access   - vacmAccess Table menu
     group    - vacmSecurityToGroup Table menu
     comm     - community Table menu
     taddr    - targetAddr Table menu
     tparam   - targetParams Table menu
     notify   - notify Table menu
     v1v2     - Enable/disable V1/V2 access
     cur      - Display current SNMPv3 configuration
```

Table 115 SNMPv3 Configuration Options

Command Syntax and Usage

usm *<usmUser number (1-16)>*

Defines a user security model (USM) entry for an authorized user.
You can also configure this entry through SNMP. To view menu options, see page 243.

view *<vacmViewTreeFamily number (1-128)>*

Allows you to create different MIB views. To view menu options, see page 244.

access *<vacmAccess number (1-32)>*

Configures the access rights. The View-based Access Control Model defines a set of services that an application can use for checking access rights of the user. You need access control when you have to process retrieval or modification request from an SNMP entity. To view menu options, see page 245.

Table 115 SNMPv3 Configuration Options

---

group *<vacmSecurityToGroup number (1-16)>*

Maps the user name to the access group names and their access rights needed to access SNMP management objects. A group defines the access rights assigned to all names that belong to a particular group. To view menu options, see page 246.

---

comm *<snmpCommunity number (1-16)>*

The community table contains objects for mapping community strings and version-independent SNMP message parameters. To view menu options, see page 247.

---

taddr *<snmpTargetAddr number (1-16)>*

Allows you to configure destination information, consisting of a transport domain and a transport address. This is also termed as transport endpoint. The SNMP MIB provides a mechanism for performing source address validation on incoming requests, and for selecting community strings based on target addresses for outgoing notifications. To view menu options, see page 248.

---

tparam *<target params index (1-16)>*

Allows you to configure SNMP parameters, consisting of message processing model, security model, security level, and security name information. There may be multiple transport endpoints associated with a particular set of SNMP parameters, or a particular transport endpoint may be associated with several sets of SNMP parameters. To view menu options, see page 249.

---

notify *<notify index (1-16)>*

A notification application typically monitors a system for particular events or conditions, and generates Notification-Class messages based on these events or conditions. To view menu options, see page 251.

---

v1v2 disable|**enable**

Allows you to enable or disable the access to SNMP version 1 and version 2.
The default setting is enabled.

---

cur

Displays the current SNMPv3 configuration.

`/cfg/sys/ssnmp/snmpv3/usm`
User Security Model Configuration

You can make use of a defined set of user identities using this Security Model. An SNMP engine must have the knowledge of applicable attributes of a user.

This menu helps you create a user security model entry for an authorized user. You need to provide a security name to create the USM entry.

```
[SNMPv3 usmUser 1 Menu]
    name      - Set USM user name
    auth      - Set authentication protocol
    authpw    - Set authentication password
    priv      - Set privacy protocol
    privpw    - Set privacy password
    del       - Delete usmUser entry
    cur       - Display current usmUser configuration
```

Table 116 User Security Model Configuration Options

Command Syntax and Usage

name *<1-32 characters>*

Defines a string that represents the name of the user. This is the login name that you need in order to access the switch.

auth md5|**sha**|**none**

Configures the authentication protocol between HMAC-MD5-96 or HMAC-SHA-96. The default algorithm is none.

authpw

Allows you to create or change your password for authentication. If you selected an authentication algorithm using the above command, you need to provide a password, otherwise you will get an error message during validation.

priv des|**none**

Configures the type of privacy protocol on your switch. The privacy protocol protects messages from disclosure. The options are des (CBC-DES Symmetric Encryption Protocol) or none. If you specify des as the privacy protocol, then make sure that you have selected one of the authentication protocols (MD5 or HMAC-SHA-96). If you select none as the authentication protocol, you will get an error message.

privpw

Defines the privacy password.

Table 116 User Security Model Configuration Options

Command Syntax and Usage

del

Deletes the selected USM user entries.

cur

Displays the selected USM user entries.

/cfg/sys/ssnmp/snmpv3/view
SNMPv3 View Configuration

```
[SNMPv3 vacmViewTreeFamily 1 Menu]
    name    - Set view name
    tree    - Set MIB subtree(OID) which defines a family of view subtrees
    mask    - Set view mask
    type    - Set view type
    del     - Delete vacmViewTreeFamily entry
    cur     - Display current vacmViewTreeFamily configuration
```

Note that the first five default `vacmViewTreeFamily` entries cannot be removed, and their names cannot be changed.

Table 117 SNMPv3 View Options

Command Syntax and Usage

name *<1-32 characters>*

Defines the name for a family of view subtrees.

tree *<object identifier, such as 1.3.6.1.2.1.1.1.0 (1-64 characters)>*

Defines the MIB tree which, when combined with the corresponding mask, defines a family of view subtrees.

mask *<bitmask, 1-32 characters>*|**none**

Configures the bit mask, which in combination with the corresponding tree, defines a family of view subtrees.

type included|**excluded**

This command indicates whether the corresponding instances of `vacmViewTreeFamilySubtree` and `vacmViewTreeFamilyMask` define a family of view subtrees, which is included in or excluded from the MIB view.

Table 117   SNMPv3 View Options

Command Syntax and Usage

del

> Deletes the `vacmViewTreeFamily` group entry.

cur

> Displays the current `vacmViewTreeFamily` configuration.

/cfg/sys/ssnmp/snmpv3/access
View-Based Access Control Model Configuration

The view-based Access Control Model defines a set of services that an application can use for checking access rights of the user. Access control is needed when the user has to process SNMP retrieval or modification request from an SNMP entity.

```
[SNMPv3 vacmAccess 1 Menu]
     name      - Set group name
     model     - Set security model
     level     - Set minimum level of security
     rview     - Set read view index
     wview     - Set write view index
     nview     - Set notify view index
     del       - Delete vacmAccess entry
     cur       - Display current vacmAccess configuration
```

Table 118   View-based Access Control Model Options

Command Syntax and Usage

name *<1-32 characters>*

> Defines the name of the group.

model usm|**snmpv1**|**snmpv2**

> Allows you to select the security model to be used.

level noAuthNoPriv|**authNoPriv**|**authPriv**

> Defines the minimum level of security required to gain access rights. The level `noAuthNoPriv` means that the SNMP message will be sent without authentication and without using a privacy protocol. The level `authNoPriv` means that the SNMP message will be sent with authentication but without using a privacy protocol. The `authPriv` means that the SNMP message will be sent both with authentication and using a privacy protocol.

Table 118   View-based Access Control Model Options

Command Syntax and Usage

rview *<1-32 characters>*

Defines a read view name that allows you read access to a particular MIB view. If the value is empty or if there is no active MIB view having this value then no access is granted.

wview *<1-32 characters>*

Defines a write view name that allows you write access to the MIB view. If the value is empty or if there is no active MIB view having this value then no access is granted.

nview *<1-32 characters>*

Defines a long notify view name that allows you notify access to the MIB view.

del

Deletes the View-based Access Control entry.

cur

Displays the View-based Access Control configuration.

/cfg/sys/ssnmp/snmpv3/group
SNMPv3 Group Configuration

```
[SNMPv3 vacmSecurityToGroup 1 Menu]
     model   - Set security model
     uname   - Set USM user name
     gname   - Set group gname
     del     - Delete vacmSecurityToGroup entry
     cur     - Display current vacmSecurityToGroup configuration
```

Table 119   SNMPv3 Group Options

Command Syntax and Usage

model usm|snmpv1|snmpv2

Defines the security model.

uname *<1-32 characters>*

Sets the user name as defined in /cfg/sys/ssnmp/snmpv3/usm/name on .

Table 119   SNMPv3 Group Options

Command Syntax and Usage

gname *<1-32 characters>*

The name for the access group as defined in
`/cfg/sys/ssnmp/snmpv3/access/name` on .

del

Deletes the `vacmSecurityToGroup` entry.

cur

Displays the current `vacmSecurityToGroup` configuration.

/cfg/sys/ssnmp/snmpv3/comm
SNMPv3 Community Table Configuration

This command is used for configuring the community table entry. The configured entry is stored in
the community table list in the SNMP engine. This table is used to configure community strings in
the Local Configuration Datastore (LCD) of SNMP engine.

```
[SNMPv3 snmpCommunityTable 1 Menu]
     index     - Set community index
     name      - Set community string
     uname     - Set USM user name
     tag       - Set community tag
     del       - Delete communityTable entry
     cur       - Display current communityTable configuration
```

Table 120   SNMPv3 Community Table Configuration Options

Command Syntax and Usage

index *<1-32 characters>*

Configures the unique index value of a row in this table.

name *<1-32 characters>*

Defines the user name as defined in the `/cfg/sys/ssnmp/snmpv3/usm/name`
command.

uname *<1-32 characters>*

Defines a readable text string that represents the corresponding value of an SNMP community
name in a security model.

Table 120 SNMPv3 Community Table Configuration Options

Command Syntax and Usage

tag *<1-255 characters>*

Configures a tag that specifies a set of transport endpoints to which a command responder application sends an SNMP trap.

del

Deletes the community table entry.

cur

Displays the community table configuration.

/cfg/sys/ssnmp/snmpv3/taddr
SNMPv3 Target Address Table Configuration

This command is used to configure the target transport entry. The configured entry is stored in the target address table list in the SNMP engine. This table of transport addresses is used in the generation of SNMP messages.

```
[SNMPv3 snmpTargetAddrTable 1 Menu]
    name     - Set target address name
    addr     - Set target transport address IP
    port     - Set target transport address port
    taglist  - Set tag list
    pname    - Set targetParams name
    del      - Delete targetAddrTable entry
    cur      - Display current targetAddrTable configuration
```

Table 121 Target Address Table Options

Command Syntax and Usage

name *<1-32 characters>*

Defines the locally arbitrary, but unique identifier, target address name associated with this entry.

addr *<transport IP address>*

Configures a transport IPv4 or IPv6 address that can be used in the generation of SNMP traps. IPv6 addresses are not displayed in the configuration, but they do receive traps.

port *<transport address port>*

Configures a transport address port that can be used in the generation of SNMP traps.

Table 121 Target Address Table Options

Command Syntax and Usage

taglist *<1-255 characters>*

Allows you to configure a list of tags that are used to select target addresses for a particular operation.

pname *<1-32 characters>*

Defines the name as defined in the `/cfg/sys/ssnmp/snmpv3/tparam/name` command on .

del

Deletes the Target Address Table entry.

cur

Displays the current Target Address Table configuration.

/cfg/sys/ssnmp/snmpv3/tparam
SNMPv3 Target Parameters Table Configuration

You can configure the target parameters entry and store it in the target parameters table in the SNMP engine. This table contains parameters that are used to generate a message. The parameters include the message processing model (for example: SNMPv3, SNMPv2c, SNMPv1), the security model (for example: USM), the security name, and the security level (noAuthnoPriv, authNoPriv, or authPriv).

```
[SNMPv3 snmpTargetParamsTable 1 Menu]
     name     - Set target params name
     mpmodel  - Set message processing model
     model    - Set security model
     uname    - Set USM user name
     level    - Set minimum level of security
     del      - Delete targetParamsTable entry
     cur      - Display current targetParamsTable configuration
```

Table 122 Target Parameters Table Configuration Options

Command Syntax and Usage

name *<1-32 characters>*

Defines the locally arbitrary, but unique identifier that is associated with this entry.

mpmodel snmpv1|snmpv2c|snmpv3

Configures the message processing model that is used to generate SNMP messages.

model usm|snmpv1|snmpv2

Allows you to select the security model to be used when generating the SNMP messages.

uname *<1-32 characters>*

Defines the name that identifies the user in the USM table (page 243) on whose behalf the SNMP messages are generated using this entry.

level noAuthNoPriv|authNoPriv|authPriv

Allows you to select the level of security to be used when generating the SNMP messages using this entry. The level noAuthNoPriv means that the SNMP message will be sent without authentication and without using a privacy protocol. The level authNoPriv means that the SNMP message will be sent with authentication but without using a privacy protocol. The authPriv means that the SNMP message will be sent both with authentication and using a privacy protocol.

del

Deletes the targetParamsTable entry.

cur

Displays the current targetParamsTable configuration.

/cfg/sys/ssnmp/snmpv3/notify
SNMPv3 Notify Table Configuration

SNMPv3 uses Notification Originator to send out traps. A notification typically monitors a system for particular events or conditions, and generates Notification-Class messages based on these events or conditions.

```
[SNMPv3 snmpNotifyTable 1  Menu]
     name      - Set notify name
     tag       - Set notify tag
     del       - Delete notifyTable entry
     cur       - Display current notifyTable configuration
```

Table 123 Notify Table Options

Command Syntax and Usage

name *<1-32 characters>*

Defines a locally arbitrary but unique identifier associated with this SNMP notify entry.

tag *<1-255 characters>*

Allows you to configure a tag that contains a tag value which is used to select entries in the Target Address Table. Any entry in the `snmpTargetAddrTable`, that matches the value of this tag is selected.

del

Deletes the notify table entry.

cur

Displays the current notify table configuration.

`/cfg/sys/access`
System Access Configuration

```
[System Access Menu]
     mgmt     - Management Network Definition Menu
     user     - User Access Control Menu (passwords)
     https    - HTTPS Web Access Menu
     snmp     - Set SNMP access control
     tnport   - Set Telnet server port number
     tport    - Set the TFTP Port for the system
     wport    - Set HTTP (Web) server port number
     http     - Enable/disable HTTP (Web) access
     tnet     - Enable/disable Telnet access
     tsbbi    - Enable/disable Telnet/SSH configuration from BBI
     userbbi  - Enable/disable user configuration from BBI
     cur      - Display current system access configuration
```

Table 124 System Access Options

Command Syntax and Usage

mgmt

Displays the Management Configuration menu. To view menu options, see page 254.

user

Displays the User Access Control menu. To view menu options, see page 255.

https

Displays the HTTPS menu. To view menu options, see page 258.

snmp disable|**read-only**|**read-write**

Disables or provides read-only/write-read SNMP access.

tnport *<TCP port number>*

Sets an optional telnet server port number for cases where the server listens for telnet sessions on a non-standard port.

tport *<TFTP port number (1-65535)>*

Sets the TFTP port for the switch. The default is port 69.

wport *<TCP port number (1-65535)>*

Sets the switch port used for serving switch Web content. The default is HTTP port 80. If Global Server Load Balancing is to be used, set this to a different port (such as 8080).

Table 124 System Access Options

Command Syntax and Usage

http disable|enable

Enables or disables HTTP (Web) access to the Browser-Based Interface. It is enabled by default.

tnet enable|disable

Enables or disables Telnet access. This command is enabled by default.

tsbbi enable|disable

Enables or disables Telnet/SSH configuration access through the Browser-Based Interface (BBI).

userbbi enable|disable

Enables or disables user configuration access through the Browser-Based Interface (BBI).

cur

Displays the current system access parameters.

/cfg/sys/access/mgmt
Management Networks Configuration

```
[Management Networks Menu]
     add      - Add mgmt network definition
     rem      - Remove mgmt network definition
     cur      - Display current mgmt network definitions
     clear    - Clear current mgmt network definitions
```

This menu is used to define IP address ranges which are allowed to access the switch for management purposes.

Table 125   Management Network Options

Command Syntax and Usage

add *<mgmt network IPv4 or IPv6 address>* *<mgmt network mask or prefix length>*

Adds a defined network through which switch access is allowed through Telnet, SNMP, RIP, or the BLADEOS browser-based interface. A range of IP addresses is produced when used with a network mask address. Specify an IP address and mask address in dotted-decimal notation.

Note: If you configure the management network without including the switch interfaces, the configuration causes the Firewall Load Balancing health checks to fail and creates a "Network Down" state on the network.

You can add up to 10 management networks.

rem *<mgmt network IPv4 or IPv6 address>* *<mgmt network mask or prefix length>*

Removes a defined network, which consists of a management network address and a management network mask address.

cur

Displays the current configuration.

clear

Removes all defined management networks.

/cfg/sys/access/user
User Access Control Configuration

```
[User Access Control Menu]
    uid      - User ID Menu
    eject    - Eject user
    usrpw    - Set user password (user)
    opw      - Set operator password (oper)
    admpw    - Set administrator password (admin)
    strongpw - Strong password menu
    cur      - Display current user status
```

Note – Passwords can be a maximum of 128 characters.

Table 126 User Access Control Options

Command Syntax and Usage

uid *<User ID (1-10)>*

Displays the User ID menu. To view menu options, see page 256.

eject user|**oper**|**admin**|**<***user name***>**

Ejects the specified user from the switch.

usrpw *<1-128 characters>*

Sets the user (user) password. The user has no direct responsibility for switch management. The user view switch status information and statistics, but cannot make any configuration changes.

Note: To disable the user account, set the password to null (no password).

opw *<1-128 characters>*

Sets the operator (oper) password. The operator manages all functions of the switch. The operator can view all switch information and statistics and can reset ports.

Note: To disable the operator account, set the password to null (no password). The default setting is disabled (no password).

Table 126 User Access Control Options

Command Syntax and Usage

admpw *<1-128 characters>*

Sets the administrator (`admin`) password. The administrator has complete access to all menus, information, and configuration commands on the G8000, including the ability to change both the user and administrator passwords.

Access includes "`oper`" functions.

Note: You cannot disable the administrator password.

strongpw

Displays the Strong User Password menu. To view menu options, see .

cur

Displays the current user status.

/cfg/sys/access/user/uid *<1-10>*
System User ID Configuration

```
[User ID 1 Menu]
    cos      - Set class of service
    name     - Set user name
    pswd     - Set user password
    ena      - Enable user ID
    dis      - Disable user ID
    del      - Delete user ID
    cur      - Display current user configuration
```

Table 127 User ID Configuration Options

Command Syntax and Usage

cos *<user | oper | admin>*

Sets the Class-of-Service to define the user's authority level. BLADEOS defines these levels as: User, Operator, and Administrator, with User being the most restricted level.

name *<1-8 characters>*

Sets the user name (maximum of eight characters).

pswd *<1-128 characters>*

Sets the user password.

Table 127 User ID Configuration Options

Command Syntax and Usage

ena

Enables the user ID.

dis

Disables the user ID.

del

Deletes the user ID.

cur

Displays the current user ID configuration.

/cfg/sys/access/user/strongpw
Strong Password Configuration

```
[Strong Pwd Menu]
    ena     - Enable usage of strong passwords
    dis     - Disable usage of strong passwords
    expiry  - Set password validity
    warning - Set warning days before pswd expiry
    faillog - Set number of failed logins for security notification
    cur     - Display current strong password configuration
```

Table 128 Strong Password Options

Command Syntax and Usage

ena

Enables Strong Password requirement.

dis

Disables Strong Password requirement.

expiry *<1-365>*

Configures the number of days allowed before the password must be changed. The default value is 60 days.

warning *<1-365>*

Configures the number of days before password expiration, that a warning is issued to users. The default value is 15 days.

Table 128 Strong Password Options

Command Syntax and Usage

faillog *<1-255>*

Configures the number of failed login attempts allowed before a security notification is logged. The default value is 3 login attempts.

cur

Displays the current Strong Password configuration.

/cfg/sys/access/https
HTTPS Access Configuration

```
[https Menu]
     access   - Enable/Disable HTTPS Web access
     port     - HTTPS WebServer port number
     generate - Generate self-signed HTTPS server certificate
     certSave - save HTTPS certificate
     cur      - Display current SSL Web Access configuration
```

Table 129 HTTPS Access Configuration Options

Command Syntax and Usage

access ena|dis

Enables or disables BBI access (Web access) using HTTPS.

port *<TCP port number>*

Defines the HTTPS Web server port number. The default port is 443.

Table 129   HTTPS Access Configuration Options

Command Syntax and Usage

generate

Allows you to generate a certificate to connect to the SSL to be used during the key exchange. A default certificate is created when HTTPS is enabled for the first time. The user can create a new certificate defining the information that they want to be used in the various fields. For example:

☐   Country Name (2 letter code) []: CA

☐   State or Province Name (full name) []: Ontario

☐   Locality Name (for example, city) []: Ottawa

☐   Organization Name (for example, company) []: Blade

☐   Organizational Unit Name (for example, section) []: Datacenter

☐   Common Name (for example, user's name) []: Mr Smith

☐   Email (for example, email address) []: info@bladenetwork.net

You will be asked to confirm if you want to generate the certificate. It will take approximately 30 seconds to generate the certificate. Then the switch will restart SSL agent.

certSave

Allows the client, or the Web browser, to accept the certificate and save the certificate to Flash to be used when the switch is rebooted.

cur

Displays the current SSL Web Access configuration.

/cfg/sys/dst
Custom Daylight Savings Time Configuration

```
[Custom DST Menu]
     dststart - Set the DST start day
     dstend   - Set the DST stop day
     ena      - Enable custom DST
     dis      - Disable custom DST
     cur      - Display custom DST configuration
```

Use this menu to configure custom Daylight Savings Time. The DST will be defined by two rules, the start rule and end rule. The rules specify the date and time when the DST starts and finishes. These dates are represented as specific calendar dates or as relative offsets in a month (for example, 'the second Sunday of September').

Relative offset example:
2070901 = Second Sunday of September, at 1:00 a.m.

Calendar date example:
0070901 = September 7, at 1:00 a.m.

Table 130   Custom DST Configuration Options

Command Syntax and Usage

dststart {$<WDDMMhh>$**}**

Configures the start date for custom DST, as follows:

WDMMhh

W = week (0-5, where 0 means use the calender date)
D = day of the week (01-07, where 01 is Monday)
MM = month (1-12)
hh = hour (0-23)

Note: Week 5 is always considered to be the last week of the month.

dstend {$<WDDMMhh>$**}**

Configures the end date for custom DST, as follows:

WDMMhh

W = week (0-5, where 0 means use the calender date)
D = day of the week (01-07, where 01 is Monday)
MM = month (1-12)
hh = hour (0-23)

Note: Week 5 is always considered to be the last week of the month.

Table 130 Custom DST Configuration Options

Command Syntax and Usage

ena

Enables the Custom Daylight Savings Time settings.

dis

Disables the Custom Daylight Savings Time settings.

cur

Displays the current Custom DST configuration.

/cfg/sys/sflow
sFlow Configuration

```
[sFlow Menu]
     ena      - Enable sFlow
     dis      - Disable sFlow
     saddress - Set the sFlow Analyzer IP address
     sport    - Set the sFlow Analyzer port
     port     - sFlow port Menu
     cur      - Display sFlow configuration
```

sFlow is a sampling method used for monitoring high speed switched networks. Use this menu to configure the sFlow agent on the switch.

Table 131 sFlow Configuration Options

Command Syntax and Usage

ena

Enables the sFlow agent.

dis

Disables the sFlow agent.

saddress *<IP address>*

Defines the sFlow server address.

sport *<1-65535>*

Configures the UDP port for the sFlow server. The default value is 6343.

Table 131   sFlow Configuration Options

Command Syntax and Usage

port *<port alias or number>*

>   Configures the sFlow interface port.

cur

>   Displays the current sFlow configuration.

`/cfg/sys/sflow/port` *<port alias or number>*
sFlow Port Configuration

```
[sFlow Port Menu]
    polling  - Set the sFlow polling interval
    sampling - Set the sFlow sampling rate
    cur      - Display sFlow port configuration
```

Use this menu to configure the sFlow port on the switch.

Table 132   sFlow Port Configuration Options

Command Syntax and Usage

polling *<5-60>*|**0**

>   Configures the sFlow polling interval, in seconds. The default value is 0 (disabled).

sampling *<256-65536>*|**0**

>   Configures the sFlow sampling rate, in packets per sample. The default value is 0 (disabled).

cur

>   Displays the current sFlow port configuration.

/cfg/sys/srvport
Server Port Configuration

```
[Server ports Menu]
     add      - Add a port to the server ports list
     rem      - Remove a port from the server ports list
     cur      - Display current Server Ports configuration
```

Use these commands to define a list of server ports. Ports that are not configured as server ports are considered to be uplink ports. VMready learns Virtual Machine information only from server ports.

Table 133 Server Port Configuration Options

Command Syntax and Usage

add *<port alias or number>*

Adds one or more port physical ports to the list of server ports.

rem *<port alias or number>*

Removes one of more ports from the list of server ports.

cur

Displays the current server port configuration.

/cfg/port *<port alias or number>*
Port Configuration Menu

```
[Port 1 Menu]
     errdis   - ErrDisable Menu
     gig      - Gig Phy Menu
     udld     - UDLD Menu
     oam      - OAM Menu
     aclqos   - Acl/Qos Configuration Menu
     stp      - STP Menu
     8021ppri - Set default 802.1p priority
     pvid     - Set default port VLAN id
     name     - Set port name
     bpdugrd  - Enable/disable BPDU Guard
     dscpmrk  - Enable/disable DSCP remarking for port
     rmon     - Enable/disable RMON for port
     learn    - Enable/Disable FDB Learning for port
     tag      - Enable/disable VLAN tagging for port
     tagpvid  - Enable/disable tagging on pvid
     floodblk - Enable/disable Port flood blocking
     macnotif - Enable/disable MAC address notification
     brate    - Set BroadCast Threshold
     mrate    - Set MultiCast Threshold
     drate    - Set Dest. Lookup Fail Threshold
     ena      - Enable port
     dis      - Disable port
     cur      - Display current port configuration
```

Use the Port Configuration menu to configure settings for interface ports.

Table 134   Port Configuration Menu Options

Command Syntax and Usage

errdis

Displays the Error Disable and Recovery menu. To view menu options, see page 267.

gig

If a port is configured to support Gigabit Ethernet, this option displays the Gigabit Ethernet Physical Link menu. To view menu options, see page 268.

udld

Displays the Unidirectional Link Detection (UDLD) menu. To view menu options, see page 269.

Table 134 Port Configuration Menu Options

Command Syntax and Usage

oam

> Displays the OAM Discovery Configuration menu. To view menu options, see .

aclqos

> Displays the ACL/QoS Configuration menu. To view menu options, see .

stp

> Displays the Spanning Tree Port menu. To view menu options, see .

8021ppri *<0-7>*

> Configures the port's 802.1p priority level.

pvid *<VLAN number>*

> Sets the default VLAN number which will be used to forward frames which are not VLAN tagged. The default number is 1.

name *<1-64 characters>*|**none**

> Sets a name for the port. The assigned port name appears next to the port number on some information and statistics screens. The default setting is none.

bpdugrd e|d

> Enables or disables BPDU guard, to avoid Spanning-Tree loops on ports with Port Fast Forwarding enabled (**/cfg/l2/stp** *x***/port** *x***/fastfwd ena**), or ports configured as edge ports.

dscpmark

> Enables or disables DSCP re-marking on a port.

rmon e|d

> Enables or disables Remote Monitoring for the port. RMON must be enabled for any RMON configurations to function.

learn disable|**enable**

> Enables or disables FDB learning on the port.

tag disable|**enable**

> Disables or enables VLAN tagging for this port. The default setting is disabled.

Table 134 Port Configuration Menu Options

Command Syntax and Usage

tagpvid disable|**enable**

Disables or enables VLAN tag persistence. When disabled, the VLAN tag is removed from packets whose VLAN tag matches the port PVID. The default setting is disabled.

floodblk disable|**enable**

Enables or disables port Flood Blocking. When enabled, unicast and multicast packets with unknown destination MAC addresses are blocked from the port.

macnotif enable|**disable**

Enables or disables MAC Address Notification. With MAC Address Notification enabled, the switch generates a syslog message when a MAC address is added or removed from the MAC address table.

brate *<0-2097151>*|**dis**

Limits the number of broadcast packets per second to the specified value. If disabled (dis), the port forwards all broadcast packets.

mrate *<0-2097151>*|**dis**

Limits the number of multicast packets per second to the specified value. If disabled (dis), the port forwards all multicast packets.

drate *<0-2097151>*|**dis**

Limits the number of unknown unicast packets per second to the specified value. If disabled (dis), the port forwards all unknown unicast packets.

ena

Enables the port.

dis

Disables the port. (To temporarily disable a port without changing its configuration attributes, refer to)

cur

Displays current port parameters.

Temporarily Disabling a Port

To temporarily disable a port without changing its stored configuration attributes, enter the following command at any prompt:

```
Main# /oper/port <port alias or number>/dis
```

Because this configuration sets a temporary state for the port, you do not need to use `apply` or `save`. The port state will revert to its original configuration when the G8000 is reset. See the "Operations Menu" on page 459 for other operations-level commands.

/cfg/port *<port alias or number>*/errdis
Port Error Disable and Recovery Configuration

```
[Port 2 ErrDisable Menu]
     ena       - Enable ErrDisable recovery
     dis       - Disable ErrDisable recovery
     cur       - Display current ErrDisable configuration
```

The Error Disable and Recovery feature allows the switch to automatically disable a port if an error condition is detected on the port. The port remains in the error-disabled state until it is re-enabled manually, or re-enabled automatically by the switch after a timeout period has elapsed. The error-disabled state of a port does not persist across a system reboot.

Table 135   Port Error Disable Configuration Options

Command Syntax and Usage

ena

Enables automatic error-recovery for the port. The default setting is `enabled`.

Note: Error-recovery must be enabled globally before port-level commands become active (**/cfg/sys/errdis/ena**).

dis

Enables automatic error-recovery for the port.

cur

Displays current port Error Disable parameters.

/cfg/port <port alias or number>/gig
Port Link Configuration

```
[Gigabit Link Menu]
     speed    - Set link speed
     mode     - Set full or half duplex mode
     fctl     - Set flow control
     auto     - Set autonegotiation
     cur      - Display current gig link configuration
```

Link menu options are described in the following table.

Table 136   Port Link Configuration Options

Command Syntax and Usage

speed 10|100|1000|10000|any

Sets the link speed. Some options are not valid on all ports. The choices include:

- □ 10 Mbps
- □ 100 Mbps
- □ 1000 Mbps
- □ 10000 Mps
- □ any (auto negotiate port speed)

mode full|half|any

Sets the operating mode. Some options are not valid on all ports. The choices include:

- □ Full-duplex
- □ Half-duplex
- □ "Any," for auto negotiation (default)

fctl rx|tx|both|none

Sets the flow control. The choices include:

- □ Receive flow control
- □ Transmit flow control
- □ Both receive and transmit flow control (default)
- □ No flow control

cur

Displays current port parameters.

/cfg/port *<port alias or number>*/udld
UniDirectional Link Detection Configuration

```
[UDLD Menu]
     mode      - Set UDLD mode
     ena       - Enable UDLD
     dis       - Disable UDLD
     cur       - Display current port UDLD configuration
```

UDLD menu options are described in the following table.

Table 137   Port UDLD Configuration Options

Command Syntax and Usage

mode normal|aggressive

Configures the UDLD mode for the selected port, as follows:

□ **Normal**: Detect unidirectional links that have mis-connected interfaces. The port is disabled if UDLD determines that the port is mis-connected.

□ **Aggressive**: In addition to the normal mode, the aggressive mode disables the port if the neighbor stops sending UDLD probes for 7 seconds.

ena

Enables UDLD on the port.

dis

Disables UDLD on the port.

cur

Displays current port UDLD parameters.

/cfg/port *<port alias or number>*/oam
Port OAM Configuration

```
[OAM Menu]
     ena       - Enable OAM Discovery process
     dis       - Disable OAM Discovery process
     mode      - Set OAM mode
     cur       - Display current port OAM configuration
```

Operation, Administration, and Maintenance (OAM) protocol allows the switch to detect faults on the physical port links. OAM is described in the IEEE 802.3ah standard.

OAM menu options are described in the following table.

Table 138 Port OAM Configuration Options

Command Syntax and Usage

ena

Enables OAM discovery on the port.

dis

Disables OAM discovery on the port.

mode active|passive

Configures the OAM discovery mode, as follows:

□ Active: This port link initiates OAM discovery.

□ Passive: This port allows its peer link to initiate OAM discovery.

If OAM determines that the port is in an anomalous condition, the port is disabled.

cur

Displays current port OAM parameters.

/cfg/port *<port alias or number>*/aclqos
Port ACL Configuration

```
[Port 1 ACL Menu]
     add      - Add ACL or ACL group to this port
     rem      - Remove ACL or ACL group from this port
     cur      - Display current ACLs for this port
```

Table 139 Port ACL Options

Command Syntax and Usage

add acl|acl6|grp *<ACL or ACL group number>*

Adds the specified ACL or ACL Group to the port. You can add multiple ACLs and ACL Groups to a port, but the total number of precedence levels allowed is five.

Note: When IPv6 ACLs are applied to a port, IPv4 ACLs are restricted to ACL 1-256.

rem acl|acl6|grp *<ACL or ACL group number>*

Removes the specified ACL or ACL group from the port.

cur

Displays current ACL QoS parameters.

/cfg/port *<port alias or number>*/stp
Port Spanning Tree Configuration

```
[Port 1 STP Menu]
    edge    - Enable/disable edge port (for PVRST only)
    link    - Set port link type
    cur     - Display current port stp configuration
```

Table 140 Port STP Options

Command Syntax and Usage

edge e|d

Enables or disables this port as an edge port. An edge port is not connected to a bridge, and can begin forwarding traffic as soon as the link is up. Configure server ports as edge ports (enabled).

Note: After you configure the port as an edge port, you must disable the port (**/oper/port** *x*/**dis**) and then re-enable the port (**/oper/port** *x*/**ena**) for the change to take effect.

link {auto|p2p|shared}

Defines the type of link connected to the port, as follows:

☐ auto: Configures the port to detect the link type, and automatically match its settings.

☐ p2p: Configures the port for Point-To-Point protocol.

☐ shared: Configures the port to connect to a shared medium (usually a hub).

The default link type is auto.

cur

Displays current STP parameters for the port.

/cfg/stack
Stacking Menu

```
[Stacking Menu]
     swnum    - Switch Number Menu
     name     - Set stack name
     backup   - Set backup switch number
     cur      - Display current stacking configuration
```

A *stack* is a group of switches that work together as a unified system. The network views a stack of switches as a single entity, identified by a single network IP address. The Stacking Configuration menu is used to configure a stack, and to define the Master and Backup interface that represents the stack on the network.

The Stacking Configuration menu is available only after Stacking is enabled and the switch is reset. For more information, see "Stacking Boot Menu" on page 513.

Table 141   Stacking Menu Options

Command Syntax and Usage

swnum   *<switch number (1-6)>*

Displays the Stacking Switch menu. To view menu options, see .

name   *<1-32 characters>*

Defines a name for the stack.

backup   *<1-6>***|0**

Defines the backup switch in the stack, based on its configured switch number (csnum).

cur

Displays the current stacking parameters.

/cfg/stack/swnum *<1-6>*
Stacking Switch Menu

```
[Switch 1 Menu]
     bind    - Bind UUID with switch in stack
     mac     - Set UUID with MAC addr
     del     - Delete switch
     cur     - Display current Switch configuration
```

Table 142   Stacking Switch Menu Options

Command Syntax and Usage
bind *<asnum (1-6)>*
Binds the selected switch to the stack, based on its assigned switch number (asnum).
mac *<MAC address>*
Binds the selected switch to the stack, based on its MAC address.
del
Deletes the selected switch from the stack.
cur
Displays the current stacking switch parameters.

`/cfg/qos`
Quality of Service Configuration Menu

```
[QOS Menu]
     8021p     - 802.1p Menu
     dscp      - Dscp Menu
     cur       - Display current QOS configuration
```

Use the Quality of Service (QoS) menus to configure the 802.1p priority value and DiffServ Code Point (DSCP) value of incoming packets. This allows you to differentiate between various types of traffic, and provide different priority levels.

Table 143   Quality of Service Menu Options

Command Syntax and Usage

8021p

Displays 802.1p Configuration menu. To view menu options, see .

dscp

Displays DSCP Configuration menu. To view menu options, see .

cur

Displays the current QOS parameters.

/cfg/qos/8021p
802.1p Configuration

```
[802.1p Menu]
    priq     - Set priority to COS queue mapping
    qweight  - Set weight to a COS queue
    numcos   - Set number of COS queue
    default  - Reset 802.1p configuration to default values.
    cur      - Display current 802.1p configuration
```

This feature provides the capability to filter IP packets based on the 802.1p bits in the packet's VLAN header. The 802.1p bits specify the priority that you should give to the packets while forwarding them. The packets with a higher (non-zero) priority bits are given forwarding preference over packets with numerically lower priority bits value.

Table 144 802.1p Options

Command Syntax and Usage

priq *<priority (0-7)>* *<COSq number>*

Maps the 802.1p priority to the Class of Service queue (COSq) priority. Enter the 802.1p priority value (0-7), followed by the COSq that handles the matching traffic. The valid range of the COSq number is set using the numcos command.

qweight *<COSq number>* *<weight (0-15)>*

Configures the weight of the selected COSq. Enter the COSq number, followed by the scheduling weight (0-15). The valid range of the COSq number is set using the numcos command.

numcos 2|8

Sets the number of Class of Service queues (COSq) for switch ports. Depending on the numcos setting, the valid COSq range for the priq and qweight commands is as follows:

☐　If numcos is 2 (the default), the COSq range is 0-1.

☐　If numcos is 8, the COSq range is 0-7.

You must apply, save, and reset the switch to activate the new configuration.

default

Resets 802.1p parameters to their default values.

cur

Displays the current 802.1p parameters.

/cfg/qos/dscp
DSCP Configuration

```
[dscp Menu]
     dscp      - Remark DSCP value to a new DSCP value
     prio      - Remark DSCP value to a 802.1p priority
     on        - Globally turn DSCP remarking ON
     off       - Globally turn DSCP remarking OFF
     cur       - Display current DSCP remarking configuration
```

Use this menu map the DiffServ Code Point (DSCP) value of incoming packets to a new value, or to an 802.1p priority value.

Table 145 DSCP Options

Command Syntax and Usage

dscp *<DSCP (0-63)> <new DSCP (0-63)>*

Maps the initial DiffServ Code Point (DSCP) value to a new value. Enter the DSCP value (0-63) of incoming packets, followed by the new value.

prio *<DSCP (0-63)> <priority (0-7)>*

Maps the DiffServ Code point value to an 802.1p priority value. Enter the DSCP value, followed by the corresponding 802.1p value.

on

Turns on DSCP re-marking globally.

off

Turns off DSCP re-marking globally.

cur

Displays the current DSCP parameters.

Access Control List Configuration Menu

```
[ACL Menu]
     acl      - Access Control List Item Config Menu
     acl6     - IPv6 Access Control List Item Config Menu
     group    - Access Control List Group Config Menu
     vmap     - Vlan Map Config Menu
     cur      - Display current ACL configuration
```

Use this menu to create Access Control Lists (ACLs) and ACL Groups. ACLs define matching criteria used for IP filtering and Quality of Service functions.

For information about assigning ACLs to ports, see "Port ACL Configuration" on page 271.

Table 146   ACL Menu Options

Command Syntax and Usage

acl *<1-512>*

Displays Access Control List configuration menu. To view menu options, see page 279.

acl6 *<1-128>*

Displays Access Control List configuration menu. To view menu options, see page 290.

group *<1-512>*

Displays ACL Group configuration menu. To view menu options, see page 296.

vmap *<1-128>*

Displays ACL VLAN Map configuration menu. To view menu options, see page 295.

cur

Displays the current ACL parameters.

/cfg/acl/acl *<ACL number>*
ACL Configuration

```
[ACL 1 Menu]
     mirror   - Mirror Options Menu
     ethernet - Ethernet Header Options Menu
     ipv4     - IP Header Options Menu
     tcpudp   - TCP/UDP Header Options Menu
     meter    - ACL Metering Configuration Menu
     re-mark  - ACL Re-mark Configuration Menu
     pktfmt   - Set to filter specific packet format types
     egrport  - Set to filter for packets egressing this port
     action   - Set filter action
     stats    - Enable/disable statistics for this acl
     reset    - Reset filtering parameters
     cur      - Display current filter configuration
```

These menus allow you to define filtering criteria for each Access Control List (ACL).

Table 147   ACL Options

Command Syntax and Usage

mirror

Displays the ACL Port Mirror menu. To view menu options, see page 280.

ethernet

Displays the ACL Ethernet Header menu. To view menu options, see page 281.

ipv4

Displays the ACL IP Header menu. To view menu options, see page 282.

tcpudp

Displays the ACL TCP/UDP Header menu. To view menu options, see page 284.

meter

Displays the ACL Metering menu. To view menu options, see page 285.

re-mark

Displays the ACL Re-Mark menu. To view menu options, see page 286.

pktfmt *<packet format>*

Displays the ACL Packet Format menu. To view menu options, see page 289.

Table 147   ACL Options

Command Syntax and Usage

`egrport` *<port alias or number>*

Configures the ACL to function on egress packets.

`action permit|deny|setprio` *<0-7>*

Configures a filter action for packets that match the ACL definitions. You can choose to permit (pass) or deny (drop) packets, or set the 802.1p priority level (0-7).

`stats e|d`

Enables or disables the statistics collection for the Access Control List.

`reset`

Resets the ACL parameters to their default values.

`cur`

Displays the current ACL parameters.

/cfg/acl/acl *<ACL number>*/mirror
ACL Mirroring Configuration

```
[Mirror Options Menu]
    dest     - Set mirror destination
    port     - Set port as mirror target
    del      - Clear mirror settings
    cur      - Display current mirror configuration
```

This menu allows you to define port mirroring for an ACL. Packets that match the ACL are mirrored to the destination interface.

Table 148   ACL Port Mirroring Options

Command Syntax and Usage

`dest port|none`

Configures the interface type of the destination.

`port` *<port alias or number>*

Configures the destination to which packets that match this ACL are mirrored.

Table 148 ACL Port Mirroring Options

Command Syntax and Usage

del

> Removes this ACL from port mirroring.

cur

> Displays the current port mirroring parameters for the ACL.

/cfg/acl/acl *<ACL number>*/ethernet
Ethernet Filtering Configuration

```
    smac     - Set to filter on source MAC
    dmac     - Set to filter on destination MAC
    vlan     - Set to filter on VLAN ID
    etype    - Set to filter on ethernet type
    pri      - Set to filter on priority
    reset    - Reset all fields
    cur      - Display current parameters
```

This menu allows you to define Ethernet matching criteria for an ACL.

Table 149 Ethernet Filtering Options

Command Syntax and Usage

smac *<MAC address (such as 00:60:cf:40:56:00)> <mask (FF:FF:FF:FF:FF:FF)>*

> Defines the source MAC address for this ACL.

dmac *<MAC address (such as 00:60:cf:40:56:00)> <mask (FF:FF:FF:FF:FF:FF)>*

> Defines the destination MAC address for this ACL.

vlan *<VLAN number> <VLAN mask (0xfff)>*

> Defines a VLAN number and mask for this ACL.

etype [ARP|**IP**|**IPv6**|**MPLS**|**RARP**|**any|none|***<other (0x600-0xFFFF)>***]**

> Defines the Ethernet type for this ACL.

pri *<0-7>*

> Defines the Ethernet priority value for the ACL.

Table 149   Ethernet Filtering Options

Command Syntax and Usage

reset

Resets Ethernet parameters for the ACL to their default values.

cur

Displays the current Ethernet parameters for the ACL.

/cfg/acl/acl *<ACL number>***/ipv4**
IP version 4 Filtering Configuration

```
[Filtering IPv4 Menu]
     sip      - Set to filter on source IP address
     dip      - Set to filter on destination IP address
     proto    - Set to filter on prototype
     tos      - Set to filter on TOS
     reset    - Reset all fields
     cur      - Display current parameters
```

This menu allows you to define IPv4 matching criteria for an ACL.

Table 150   IP version 4 Filtering Options

Command Syntax and Usage

sip *<IP address>* *<mask (such as 255.255.255.0)>*

Defines a source IP address for the ACL. If defined, traffic with this source IP address will match this ACL. Specify an IP address in dotted decimal notation.

dip *<IP address>* *<mask (such as 255.255.255.0)>*

Defines a destination IP address for the ACL. If defined, traffic with this destination IP address will match this ACL.

Table 150   IP version 4 Filtering Options

Command Syntax and Usage

proto *<0-255>*

Defines an IP protocol for the ACL. If defined, traffic from the specified protocol matches this filter. Specify the protocol number. Listed below are some of the well-known protocols.

Number	Name
1	icmp
2	igmp
6	tcp
17	udp
89	ospf
112	vrrp

tos *<0-255>*

Defines a Type of Service (ToS) value for the ACL. For more information on ToS, refer to RFC 1340 and 1349.

reset

Resets the IPv4 parameters for the ACL to their default values.

cur

Displays the current IPv4 parameters.

/cfg/acl/acl *<ACL number>*/tcpudp
TCP/UDP Filtering Configuration

```
[Filtering TCP/UDP Menu]
     sport    - Set to filter on TCP/UDP source port
     dport    - Set to filter on TCP/UDP destination port
     flags    - Set to filter TCP/UDP flags
     reset    - Reset all fields
     cur      - Display current parameters
```

This menu allows you to define TCP/UDP matching criteria for an ACL.

Table 151   TCP/UDP Filtering Options

Command Syntax and Usage

sport *<source port (1-65535)> <mask (0xFFFF)>*

Defines a source port for the ACL. If defined, traffic with the specified TCP or UDP source port will match this ACL. Specify the port number. Listed below are some of the well-known ports:

Number	Name
20	ftp-data
21	ftp
22	ssh
23	telnet
25	smtp
37	time
42	name
43	whois
53	domain
69	tftp
70	gopher
79	finger
80	http

dport *<destination port (1-65535)> <mask (0xFFFF)>*

Defines a destination port for the ACL. If defined, traffic with the specified TCP or UDP destination port will match this ACL. Specify the port number, just as with sport above.

flags *<value (0x0-0x3f)> <mask (0x0-0x3f)>*

Defines a TCP/UDP flag for the ACL.

Table 151   TCP/UDP Filtering Options

Command Syntax and Usage

reset

Resets the TCP/UDP parameters for the ACL to their default values.

cur

Displays the current TCP/UDP Filtering parameters.

/cfg/acl/acl *<ACL number>*/meter
ACL Metering Configuration

```
[Metering Menu]
     cir      - Set committed rate in KiloBits/s
     mbsize   - Set maximum burst size in KiloBits
     enable   - Enable/disable port metering
     dpass    - Set to Drop or Pass out of profile traffic
     reset    - Reset meter parameters
     cur      - Display current settings
```

This menu defines the metering profile for the selected ACL.

Table 152   ACL Metering Options

Command Syntax and Usage

cir *<64-10000000>*

Configures the committed rate, in Kilobits per second. The committed rate must be a multiple of 64.

mbsize *<32-4096>*

Configures the maximum burst size, in Kilobits. Enter one of the following values for mbsize: 32, 64, 128, 256, 512, 1024, 2048, 4096

enable e|d

Enables or disables metering on the ACL.

dpass drop|pass

Configures the ACL Meter to either drop or pass out-of-profile traffic.

Table 152 ACL Metering Options

Command Syntax and Usage

reset

Reset ACL Metering parameters to their default values.

cur

Displays current ACL Metering parameters.

/cfg/acl/acl *<ACL number>*/re-mark
Re-Mark Configuration

```
[Re-mark Menu]
     inprof   - In Profile Menu
     outprof  - Out Profile Menu
     up1p     - Set Update User Priority Menu
     reset    - Reset re-mark settings
     cur      - Display current settings
```

You can choose to re-mark IP header data for the selected ACL. You can configure different re-mark values, based on whether packets fall within the ACL Metering profile, or out of the ACL Metering profile.

Table 153 ACL Re-Mark Options

Command Syntax and Usage

inprof

Displays the Re-Mark In-Profile menu. To view menu options, see .

outprof

Displays the Re-Mark Out-of-Profile menu. To view menu options, see .

up1p

Displays the Re-Mark Update User Priority menu. To view menu options, see .

reset

Reset ACL re-mark parameters to their default values.

cur

Displays current re-mark parameters.

/cfg/acl/acl *<ACL number>*/re-mark/inprof
Re-Marking In-Profile Configuration

```
[Re-marking - In Profile Menu]
    updscp   - Set the update DSCP
    reset    - Reset update DSCP settings
    cur      - Display current settings
```

Table 154 ACL Re-Mark In-Profile Options

Command Syntax and Usage

updscp *<0-63>*

Re-marks the DiffServ Code Point (DSCP) of in-profile packets to the selected value.

reset

Resets the update DSCP parameters to their default values.

cur

Displays current re-mark in-profile parameters.

/cfg/acl/acl *<ACL number>*/re-mark/outprof
Re-Marking Out-of-Profile Configuration

```
[Re-marking - Out Of Profile Menu]
    updscp   - Set the update DSCP
    reset    - reset update DSCP setting
    cur      - Display current settings
```

Table 155 ACL Re-Mark Out-of-Profile Options

Command Syntax and Usage

dscp e|d

Enables or disables DSCP re-marking on out-of-profile packets for the ACL.

reset

Resets the update DSCP parameters for out-of-profile packets to their default values.

cur

Displays current re-mark parameters for out-of-profile packets.

/cfg/acl/acl *<ACL number>*/re-mark/up1p
Update User Priority Configuration

```
[Update User Priority Menu]
     value   - Set the update user priority
     utosp   - Enable/Disable use of TOS precedence
     reset   - Reset in profile up1p settings
     cur     - Display current settings
```

Table 156 ACL Re-Mark Update User Priority Options

Command Syntax and Usage

value *<0-7>*

Defines 802.1p value. The value is the priority bits information in the packet structure.

utosp enable|disable

Enable or disable mapping of TOS (Type of Service) priority to 802.1p priority for in-profile packets. When enabled, the TOS value is used to set the 802.1p value.

reset

Resets UP1P settings to their default values.

cur

Displays current re-mark User Priority parameters for in-profile packets.

/cfg/acl/acl *<ACL number>*/pktfmt
Packet Format Filtering Configuration

```
[Filtering Packet Format Menu]
     ethfmt   - Set to filter on ethernet format
     tagfmt   - Set to filter on ethernet tagging format
     ipfmt    - Set to filter on IP format
     reset    - Reset all fields
     cur      - Display current parameters
```

This menu allows you to define Packet Format matching criteria for an ACL.

Table 157   ACL Packet Format Filtering Options

Command Syntax and Usage

ethfmt {none|eth2|SNAP|LLC}

Defines the Ethernet format for the ACL.

tagfmt {disabled|any|none|tagged}

Defines the tagging format for the ACL.

ipfmt {none|v4|v6}

Defines the IP format for the ACL.

reset

Resets Packet Format parameters for the ACL to their default values.

cur

Displays the current Packet Format parameters for the ACL.

/cfg/acl/acl6 *<ACL number>*
ACL IPv6 Configuration

```
[ACL6 2 Menu]
     ipv6      - IPv6 Header Options Menu
     tcpudp    - TCP/UDP Header Options Menu
     re-mark   - ACL Re-mark Configuration Menu
     egrport   - Set to filter for packets egressing this port
     action    - Set filter action
     stats     - Enable/disable statistics
     reset     - Reset filtering parameters
     cur       - Display current filter configuration
```

These menus allow you to define filtering criteria for each IPv6 Access Control List (ACL).

Table 158   IPv6 ACL Options

Command Syntax and Usage

ipv6

Displays the ACL IP Header menu. To view menu options, see page 291.

tcpudp

Displays the ACL TCP/UDP Header menu. To view menu options, see page 292.

re-mark

Displays the ACL Re-Mark menu. To view menu options, see page 293.

egrport *<port alias or number>*

Configures the ACL to function on egress packets.

action permit|deny|setprio *<0-7>*

Configures a filter action for packets that match the ACL definitions. You can choose to permit (pass) or deny (drop) packets, or set the 802.1p priority level (0-7).

stats e|d

Enables or disables the statistics collection for the Access Control List.

reset

Resets the ACL parameters to their default values.

cur

Displays the current ACL parameters.

/cfg/acl/acl6 *<ACL number>*/ipv6
IP version 6 Filtering Configuration

```
[Filtering IPv6 Menu]
    sip     - Set to filter on source IPv6 address
    dip     - Set to filter on destination IPv6 address
    nexthd  - Set to filter on IPv6 next header
    flabel  - Set to filter on IPv6 flow label
    tclass  - Set to filter on IPv6 traffic class
    reset   - Reset all fields
    cur     - Display current parameters
```

This menu allows you to define IPv6 matching criteria for an ACL.

Table 159 IP version 6 Filtering Options

Command Syntax and Usage

sip *<IPv6 address>* *<prefix length>*

Defines a source IPv6 address for the ACL. If defined, traffic with this source IP address will match this ACL.

dip *<IPv6 address>* *<prefix length>*

Defines a destination IPv6 address for the ACL. If defined, traffic with this destination IP address will match this ACL.

nexthd *<0-255>*

Defines the next header value for the ACL. If defined, traffic with this next header value will match this ACL.

flabel *<0-1048575>*

Defines the flow label for the ACL. If defined, traffic with this flow label will match this ACL.

tclass *<0-255>*

Defines the traffic class for the ACL. If defined, traffic with this traffic class will match this ACL.

reset

Resets the IPv6 parameters for the ACL to their default values.

cur

Displays the current IPv6 parameters.

/cfg/acl/acl6 *<ACL number>*/tcpudp
IPv6 TCP/UDP Filtering Configuration

```
[Filtering TCP/UDP Menu]
     sport    - Set to filter on TCP/UDP source port
     dport    - Set to filter on TCP/UDP destination port
     flags    - Set to filter TCP/UDP flags
     reset    - Reset all fields
     cur      - Display current parameters
```

This menu allows you to define TCP/UDP matching criteria for an ACL.

Table 160 IPv6 ACL TCP/UDP Filtering Options

Command Syntax and Usage

sport *<source port (1-65535)>* *<mask (0xFFFF)>*

Defines a source port for the ACL. If defined, traffic with the specified TCP or UDP source port will match this ACL. Specify the port number. Listed below are some of the well-known ports:

Number	Name
20	ftp-data
21	ftp
22	ssh
23	telnet
25	smtp
37	time
42	name
43	whois
53	domain
69	tftp
70	gopher
79	finger
80	http

dport *<destination port (1-65535)>* *<mask (0xFFFF)>*

Defines a destination port for the ACL. If defined, traffic with the specified TCP or UDP destination port will match this ACL. Specify the port number, just as with sport above.

flags *<value (0x0-0x3f)>* *<mask (0x0-0x3f)>*

Defines a TCP/UDP flag for the ACL.

Table 160 IPv6 ACL TCP/UDP Filtering Options

Command Syntax and Usage

reset

Resets the TCP/UDP parameters for the ACL to their default values.

cur

Displays the current TCP/UDP Filtering parameters.

/cfg/acl/acl6 *<ACL number>*/re-mark
IPv6 Re-Mark Configuration

```
[Re-mark Menu]
    inprof   - In Profile Menu
    up1p     - Set Update User Priority Menu
    reset    - Reset re-mark settings
    cur      - Display current settings
```

You can choose to re-mark IP header data for the selected ACL. You can configure different re-mark values, based on whether packets fall within the ACL metering profile, or out of the ACL metering profile.

Table 161 IPv6 ACL Re-mark Options

Command Syntax and Usage

inprof

Displays the Re-Mark In-Profile menu. To view menu options, see page 287.

up1p

Displays the Re-Mark Update User Priority menu. To view menu options, see page 288.

reset

Reset ACL re-mark parameters to their default values.

cur

Displays current re-mark parameters.

/cfg/acl/acl6 *<ACL number>*/re-mark/inprof
IPv6 Re-Marking In-Profile Configuration

```
[Re-marking - In Profile Menu]
    updscp   - Set the update DSCP
    reset    - Reset update DSCP settings
    cur      - Display current settings
```

Table 162 IPv6 ACL Re-Mark In-Profile Options

Command Syntax and Usage

updscp *<0-63>*

Re-marks the DiffServ Code Point (DSCP) of in-profile packets to the selected value.

reset

Resets the update DSCP parameters to their default values.

cur

Displays current re-mark in-profile parameters.

/cfg/acl/acl6 *<ACL number>*/re-mark/up1p
IPv6 Update User Priority Configuration

```
[Update User Priority Menu]
    value    - Set the update user priority
    reset    - Reset in profile up1p settings
    cur      - Display current settings
```

Table 163 IPv6 ACL Re-Mark Update User Priority Options

Command Syntax and Usage

value *<0-7>*

Defines 802.1p value. The value is the priority bits information in the packet structure.

reset

Resets UP1P settings to their default values.

cur

Displays current re-mark User Priority parameters.

/cfg/acl/vmap *<1-128>*
VLAN MAP Configuration

```
[VMAP 1 Menu]
     ethernet - Ethernet Header Options Menu
     ipv4     - IP Header Options Menu
     tcpudp   - TCP/UDP Header Options Menu
     meter    - ACL Metering Configuration Menu
     re-mark  - ACL Re-mark Configuration Menu
     pktfmt   - Set to filter specific packet format types
     egrport  - Set to filter for packets egressing this port
     action   - Set filter action
     stats    - Enable/disable statistics
     reset    - Reset filtering parameters
     cur      - Display current filter configuration
```

A VLAN Map is an Access Control List (ACL) that can be assigned to a VLAN or a VM group instead of a port. In a virtualized environment where Virtual Machines move between physical servers, VLAN Maps allow you to create traffic filtering and metering policies associated with a VM's VLAN.

For more information about VLAN Map configuration commands, see "ACL Configuration" on page 279.

For more information about assigning VLAN Maps to a VLAN, see "VLAN Configuration" on page 344.

For more information about assigning VLAN Maps to a VM group, see "VM Group Configuration" on page 451.

/cfg/acl/group *<ACL Group number>*
ACL Group Configuration

```
[ACL Group 1 Menu]
     add       - Add ACL to ACL group
     rem       - Remove ACL from ACL group
     add6      - Add IPv6 ACL to ACL group
     rem6      - Remove IPv6 ACL from ACL group
     cur       - Display current ACL items in ACL group
```

This menu allows you to compile one or more ACLs into an ACL Group. Once you create an ACL Group, you can assign the ACL Group to one or more ports.

Table 164 ACL Group Options

Command Syntax and Usage

add acl *<ACL number>*

Adds the selected ACL to the ACL Group.

rem acl *<ACL number>*

Removes the selected ACL from the ACL Group.

add6 *<1-128>*

Adds the selected IPv6 ACL to the ACL group.

rem6 *<1-128>*

Removes the selected IPv6 ACL from the ACL group.

cur

Displays the current ACL group parameters.

/cfg/pmirr
Port Mirroring Configuration

```
[Port Mirroring Menu]
      monport - Monitoring Port based PM Menu
      mirror  - Enable/Disable Mirroring
      cur     - Display All Mirrored and Monitoring Ports
```

Port mirroring is disabled by default. For more information about port mirroring on the G8000, see "Appendix A: Troubleshooting" in the *BLADEOS Application Guide*.

The Port Mirroring menu is used to configure, enable, and disable the monitor port. When enabled, network packets being sent and/or received on a target port are duplicated and sent to a monitor port. By attaching a network analyzer to the monitor port, you can collect detailed information about your network performance and usage.

Table 165   Port Mirroring Menu Options

Command Syntax and Usage

monport *<port alias or number>*

Displays port-mirroring menu. To view menu options, see page 298.

mirror disable│enable

Enables or disables port mirroring

cur

Displays current settings of the mirrored and monitoring ports.

`/cfg/pmirr/monport` *<port alias or number>*
Port-Mirroring Configuration

```
[Port 1 Menu]
     add       - Add "Mirrored" port
     rem       - Rem "Mirrored" port
     delete    - Delete this "Monitor" port
     cur       - Display current Port-based Port Mirroring configuration
```

Table 166 Port Mirroring Monitor Port Options

Command Syntax and Usage

add *<mirrored port (port to mirror from)> <direction (in, out, or both)>*

Adds the port to be mirrored. This command also allows you to enter the direction of the traffic. It is necessary to specify the direction because:

If the source port of the frame matches the mirrored port and the mirrored direction is ingress or both (ingress and egress), the frame is sent to the monitoring port.

If the destination port of the frame matches the mirrored port and the mirrored direction is egress or both, the frame is sent to the monitoring port.

rem *<mirrored port (port to mirror from)>*

Removes the mirrored port.

delete

Deletes this monitor port.

cur

Displays the current settings of the monitoring port.

Layer 2 Configuration Menu

```
[Layer 2 Menu]
    8021x   - 802.1x Menu
    amp     - Active Multipath Menu
    mrst    - Multiple Spanning Tree/Rapid Spanning Tree Menu
    nostp   - Disable Spanning Tree
    stp     - Spanning Tree Menu
    fdb     - FDB Menu
    lldp    - LLDP Menu
    trunk   - Trunk Group Menu
    thash   - Trunk Hash Menu
    lacp    - Link Aggregation Control Protocol Menu
    failovr - Failover Menu
    hotlink - Hot Links Menu
    vlan    - VLAN Menu
    pvstcomp - Enable/disable PVST+ compatibility mode
    upfast  - Enable/disable Uplink Fast
    update  - UplinkFast station update rate
    cur     - Display current layer 2 parameters
```

Table 167 Layer 2 Configuration Menu Options

Command Syntax and Usage

8021x

Displays the 802.1X Configuration menu. To view menu options, see page 301.

amp

Displays the Active MultiPath Protocol (AMP) Configuration menu. To view menu options, see page 307.

mrst

Displays the Rapid Spanning Tree/Multiple Spanning Tree Protocol Configuration menu. To view menu options, see page 311.

nostp enable|disable

When enabled, globally turns Spanning Tree off. All ports are placed into forwarding state. Any BPDU's received are flooded. BPDU Guard is not affected by this command.

stp *<group number (1-128)>*

Displays the Spanning Tree Configuration menu. To view menu options, see page 317.

Table 167 Layer 2 Configuration Menu Options

Command Syntax and Usage

fdb

Displays the Forwarding Database menu. To view menu options, see page 322.

lldp

Displays the LLDP menu. To view menu options, see page 325.

trunk *<trunk number (1-52)>*

Displays the Trunk Group Configuration menu. To view menu options, see page 330.

thash

Displays the Trunk Hash menu. To view menu options, see page 331.

lacp

Displays the Link Aggregation Control Protocol menu. To view menu options, see page 333.

failovr

Displays the Failover Configuration menu. To view menu options, see page 335.

hotlink

Displays the Hot Links Configuration menu. To view menu options, see page 340.

vlan *<VLAN number (1-4095)>*

Displays the VLAN Configuration menu. To view menu options, see page 344.

pvstcomp enable|disable

Enables or disables VLAN tagging of Spanning Tree BPDUs. The default setting is **enabled**.

upfast enable|disable

Enables or disables Fast Uplink Convergence, which provides rapid Spanning Tree convergence to an upstream switch during failover.

Note: When enabled, this feature increases bridge priorities to 65535 for all STGs and path cost by 3000 for all STP ports.

Table 167 Layer 2 Configuration Menu Options

Command Syntax and Usage

update *<10-200>*

Configures the station update rate. The default value is 40.

cur

Displays current Layer 2 parameters.

/cfg/l2/8021x
802.1X Configuration

```
[802.1x Configuration Menu]
     global   - Global 802.1x configuration menu
     port     - Port 802.1x configuration menu
     ena      - Enable 802.1x access control
     dis      - Disable 802.1x access control
     cur      - Show 802.1x configuration
```

This feature allows you to configure the G8000 as an IEEE 802.1X Authenticator, to provide port-based network access control.

Table 168 802.1X Configuration Options

Command Syntax and Usage

global

Displays the global 802.1X Configuration menu. To view menu options, see page 302.

port *<port alias or number>*

Displays the 802.1X Port menu. To view menu options, see page 305.

ena

Globally enables 802.1X.

dis

Globally disables 802.1X.

cur

Displays current 802.1X parameters.

`/cfg/l2/8021x/global`
802.1X Global Configuration

```
[802.1X Global Configuration Menu]
     gvlan    - 802.1X Guest VLAN configuration menu
     mode     - Set access control mode
     qtperiod - Set EAP-Request/Identity quiet time interval
     txperiod - Set EAP-Request/Identity retransmission timeout
     suptmout - Set EAP-Request retransmission timeout
     svrtmout - Set server authentication request timeout
     maxreq   - Set max number of EAP-Request retransmissions
     raperiod - Set reauthentication time interval
     reauth   - Set reauthentication status to on or off
     vassign  - Set dynamic VLAN assignment status to on or off
     default  - Restore default 802.1X configuration
     cur      - Display current 802.1X configuration
```

The global 802.1X menu allows you to configure parameters that affect all ports in the G8000.

Table 169   802.1X Global Configuration Options

Command Syntax and Usage

gvlan

Displays the 802.1X Guest VLAN Configuration menu. To view menu options, see page 304.

mode force-unauth|**auto**|**force-auth**

Sets the type of access control for all ports:

- ☐   `force-unauth`: the port is unauthorized unconditionally.
- ☐   `auto`: the port is unauthorized until it is successfully authorized by the RADIUS server.
- ☐   `force-auth`: the port is authorized unconditionally, allowing all traffic.

The default value is `force-auth`.

qtperiod *<0-65535>*

Sets the time, in seconds, the authenticator waits before transmitting an EAP-Request/Identity frame to the supplicant (client) after an authentication failure in the previous round of authentication. The default value is 60 seconds.

txperiod *<1-65535>*

Sets the time, in seconds, the authenticator waits for an EAP-Response/Identity frame from the supplicant (client) before retransmitting an EAP-Request/Identity frame. The default value is 30 seconds.

Table 169 802.1X Global Configuration Options

Command Syntax and Usage

suptmout *<1-65535>*

Sets the time, in seconds, the authenticator waits for an EAP-Response packet from the supplicant (client) before retransmitting the EAP-Request packet to the authentication server. The default value is 30 seconds.

svrtmout *<1-65535>*

Sets the time, in seconds, the authenticator waits for a response from the RADIUS server before declaring an authentication timeout. The default value is 30 seconds.

The time interval between transmissions of the RADIUS Access-Request packet containing the supplicant's (client's) EAP-Response packet is determined by the current setting of /cfg/sys/radius/timeout (default is 3 seconds).

maxreq *<1-10>*

Sets the maximum number of times the authenticator retransmits an EAP-Request packet to the supplicant (client). The default value is 2.

raperiod *<1-604800>*

Sets the time, in seconds, the authenticator waits before re-authenticating a supplicant (client) when periodic re-authentication is enabled. The default value is 3600 seconds.

reauth on|off

Sets the re-authentication status to on or off. The default value is off.

vassign on|off

Sets the dynamic VLAN assignment status to on or off. The default value is off.

default

Resets the global 802.1X parameters to their default values.

cur

Displays current global 802.1X parameters.

/cfg/l2/8021x/global/gvlan
802.1X Guest VLAN Configuration

```
[802.1X Guest VLAN Configuration Menu]
     vlan     - Set 8021.x Guest VLAN number
     ena      - Enable 8021.xGuest VLAN
     dis      - Disable 8021.x Guest VLAN
     cur      - Display current Guest VLAN configuration
```

The 802.1X Guest VLAN menu allows you to configure a Guest VLAN for unauthenticated ports. The Guest VLAN provides limited access to switch functions.

Table 170   802.1X Guest VLAN Configuration Options

Command Syntax and Usage

vlan *<VLAN number>*

Configures the Guest VLAN number.

ena

Enables the 802.1X Guest VLAN.

dis

Disables the 802.1X Guest VLAN.

cur

Displays current 802.1X Guest VLAN parameters.

`/cfg/l2/8021x/port` *<port alias or number>*
802.1X Port Configuration

```
[802.1X Port Configuration Menu]
    mode     - Set access control mode
    qtperiod - Set EAP-Request/Identity quiet time interval
    txperiod - Set EAP-Request/Identity retransmission timeout
    suptmout - Set EAP-Request retransmission timeout
    svrtmout - Set server authentication request timeout
    maxreq   - Set max number of EAP-Request retransmissions
    raperiod - Set reauthentication time interval
    reauth   - Set reauthentication status to on or off
    vassign  - Set dynamic VLAN assignment status to on or off
    default  - Restore default 802.1X configuration
    global   - Apply current global 802.1X configuration to this port
    cur      - Display current 802.1X configuration
```

The 802.1X port menu allows you to configure parameters that affect the selected port in the G8000. These settings override the global 802.1X parameters.

Table 171 802.1X Port Configuration Options

Command Syntax and Usage

`mode force-unauth|auto|force-auth`

Sets the type of access control for the port:

☐ **`force-unauth`** - the port is unauthorized unconditionally.

☐ **`auto`** - the port is unauthorized until it is successfully authorized by the RADIUS server.

☐ **`force-auth`** - the port is authorized unconditionally, allowing all traffic.

The default value is force-auth.

`qtperiod` *<0-65535>*

Sets the time, in seconds, the authenticator waits before transmitting an EAP-Request/Identity frame to the supplicant (client) after an authentication failure in the previous round of authentication. The default value is 60 seconds.

`txperiod` *<1-65535>*

Sets the time, in seconds, the authenticator waits for an EAP-Response/Identity frame from the supplicant (client) before retransmitting an EAP-Request/Identity frame. The default value is 30 seconds.

Table 171   802.1X Port Configuration Options

Command Syntax and Usage

suptmout *<1-65535>*

Sets the time, in seconds, the authenticator waits for an EAP-Response packet from the supplicant (client) before retransmitting the EAP-Request packet to the authentication server. The default value is 30 seconds.

svrtmout *<1-65535>*

Sets the time, in seconds, the authenticator waits for a response from the RADIUS server before declaring an authentication timeout. The default value is 30 seconds.

The time interval between transmissions of the RADIUS Access-Request packet containing the supplicant's (client's) EAP-Response packet is determined by the current setting of /cfg/sys/radius/timeout (default is 3 seconds).

maxreq *<1-10>*

Sets the maximum number of times the authenticator retransmits an EAP-Request packet to the supplicant (client). The default value is 2.

raperiod *<1-604800>*

Sets the time, in seconds, the authenticator waits before re-authenticating a supplicant (client) when periodic re-authentication is enabled. The default value is 3600 seconds.

reauth on|**off**

Sets the re-authentication status to on or off. The default value is off.

vassign on|**off**

Sets the dynamic VLAN assignment status to on or off. The default value is off.

default

Resets the 802.1X port parameters to their default values.

global

Applies current global 802.1X configuration parameters to the port.

cur

Displays current 802.1X port parameters.

/cfg/l2/amp
Active MultiPath Protocol Configuration

```
[Active Multipath Menu]
 group    - Active Multipath Group Configuration Menu
 agglacp  - Set active multipath aggregator LACP trunk
 aggport  - Set active multipath aggregator port
 aggtrk   - Set active multipath aggregator static trunk
 interval - Set active multipath packet interval
 priority - Set active multipath switch priority
 timeout  - Set active multipath timeout count to detect unhealthy links
 type     - Set active multipath switch type
 on       - Globally turn active multipath ON
 off      - Globally turn active multipath OFF
 default  - Default active multipath parameters
 cur      - Display current active multipath configuration
```

Use the following commands to configure Active Multipath (AMP) for the G8000.

Table 172 AMP Configuration Options

Command Syntax and Usage

group *<1-22>*

Displays the AMP group menu. To view menu options, see .

agglacp *<1-65535>*|0

Configures an LACP *admin key* to be used as the AMP Aggregator link. LACP trunks formed with this *admin key* will be used to link the two AMP Aggregators. Enter 0 (zero) to clear the Aggregator link.

Note: This command does not apply to AMP Access switches.

aggport *<port alias or number>*|0

Configures a port to be used as the AMP Aggregator link. Enter 0 (zero) to clear the Aggregator link.

Note: This command does not apply to AMP Access switches.

aggtrk *<trunk number>*|0

Configures a trunk to be used as the AMP Aggregator link. Enter 0 (zero) to clear the Aggregator link.

Note: This command does not apply to AMP Access switches.

Table 172 AMP Configuration Options

Command Syntax and Usage
interval *<10-10000>*
Configures the time interval between AMP *keep alive* messages, in centi-seconds. The default value is 50.
priority *<1-255>*
Configures the AMP priority for the switch. The default value is 255.
A lower priority value denotes a higher precedence (so priority 1 is the highest priority.) It is recommended that aggregator switches be configured with lower priority values than access switches.
timeout *<1-20>*
Configures the timeout count, which is the number of unreceived keep-alive packets the switch waits before declaring a timeout due to loss of connectivity with the peer. The default value is 4.
type access|aggregator
Defines the AMP switch type, as follows:
□ **Access**: Connects to downstream servers. Only one AMP group can be configured on an access switch.
□ **Aggregator**: Connects to upstream routers. Multiple AMP groups can be configured on an Aggregator switch.
The default switch type is access.
on
Globally turns Active MultiPath on.
off
Globally turns Active MultiPath off.
default
Resets Active MultiPath parameters to their default values, and optionally delete all AMP groups.
cur
Displays the current AMP parameters.

/cfg/l2/amp/group *<1-22>*
AMP Group Configuration

```
[AMP Group 1 Menu]
     port    - Add port to AMP group
     port2   - Add second port to AMP group
     lacp    - Add LACP trunk to AMP group
     lacp2   - Add second LACP trunk to AMP group
     trunk   - Add static trunk to AMP group
     trunk2  - Add second static trunk to AMP group
     ena     - Enable AMP group
     dis     - Disable AMP group
     del     - Delete AMP group
     cur     - Display current AMP group configuration
```

Use the following commands to configure an AMP group.

Table 173 AMP Group Configuration Options

Command Syntax and Usage

port *<port alias or number>*|0

Adds the port as the first port in the AMP group. Enter 0 (zero) to clear the port.

port2 *<port alias or number>*|0

Adds the port as the second port in the AMP group. Enter 0 (zero) to clear the port.

lacp *<1-65535>*|0

Adds the first LACP *admin key* to the AMP group. LACP trunks formed with this *admin key* will be used for AMP communication. Enter 0 (zero) to clear the *admin key.*

lacp2 *<1-65535>*|0

Adds the second LACP *admin key* to the AMP group. LACP trunks formed with this *admin key* will be used for AMP communication. Enter 0 (zero) to clear the *admin key.*

trunk *<trunk number>*|0

Adds the first trunk group to the AMP group. Enter 0 (zero) to clear the trunk group.

trunk2 *<trunk number>*|0

Adds the second trunk group to the AMP group. Enter 0 (zero) to clear the trunk group.

ena

Enables the AMP group.

Table 173 AMP Group Configuration Options

Command Syntax and Usage

dis

    Disables the AMP group.

del

    Deletes the AMP group.

cur

    Displays the current AMP group configuration.

/cfg/l2/mrst
RSTP/MSTP/PVRST Configuration

```
[Multiple Spanning Tree Menu]
   cist    - Common and Internal Spanning Tree menu
   name    - Set MST region name
   rev     - Set revision level of this MST region
   maxhop  - Set Maximum Hop Count for MST (4 - 60)
   mode    - Spanning Tree Mode
   on      - Globally turn Multiple Spanning Tree (MSTP/RSTP/PVRST) ON
   off     - Globally turn Multiple Spanning Tree (MSTP/RSTP/PVRST) OFF
   cur     - Display current MST parameters
```

BLADEOS supports STP/PVST+, the IEEE 802.1w Rapid Spanning Tree Protocol (RSTP), IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), and Per VLAN Rapid Spanning Tree Protocol (PVRST+). MSTP allows you to map many VLANs to a small number of Spanning Tree Groups (STGs), each with its own topology.

Up to 32 Spanning Tree Groups can be configured in **mstp** mode. MRST is turned off by default and the default STP mode is RSTP.

Table 174 MSTP/RSTP/PVRST Configuration Options

Command Syntax and Usage

cist

Displays the Common Internal Spanning Tree (CIST) menu. To view menu options, see page 313.

name *<1-32 characters>*

Configures a name for the MSTP region. All devices within a MSTP region must have the same region name.

rev *<0-65535>*

Configures a version number for the MSTP region. The version is used as a numerical identifier for the region. All devices within a MSTP region must have the same version number.

maxhop *<4-60>*

Configures the maximum number of bridge hops a packet may traverse before it is dropped. The default is 20.

Table 174 MSTP/RSTP/PVRST Configuration Options

Command Syntax and Usage

mode rstp|mstp|pvrst

Selects the Spanning Tree mode, as follows: Per VLAN Rapid Spanning Tree Plus (**pvrst**), Rapid Spanning Tree (**rstp**), Multiple Spanning Tree (**mstp**).

The default mode is RSTP.

on

Globally turns RSTP/MSTP/PVRST+ on.

Note: When RSTP is turned on, the configuration parameters for STG 1 apply to RSTP.

off

Globally turns RSTP/MSTP/PVRST+ off.

cur

Displays the current RSTP/MSTP/PVRST+ configuration.

/cfg/l2/mrst/cist
Common Internal Spanning Tree Configuration

```
[Common Internal Spanning Tree Menu]
  brg     - CIST Bridge parameter menu
  port    - CIST Port parameter menu
  add     - Add VLAN(s) to CIST
  default - Default Common Internal Spanning Tree and Member parameters
  cur     - Display current CIST parameters
```

Table 175 describes the commands used to configure Common Internal Spanning Tree (CIST) parameters. The CIST provides compatibility with different MSTP regions and with devices running different Spanning Tree instances. It is equivalent to Spanning Tree Group 0.

Table 175   CIST Configuration Options

Command Syntax and Usage

brg

Displays the CIST Bridge menu. To view menu options, see page 314.

port *<port alias or number>*

Displays the CIST Port menu. To view menu options, see page 315.

add *<VLAN numbers>*

Adds selected VLANs to the CIST.

default

Resets all CIST parameters to their default values.

cur

Displays the current CIST configuration.

/cfg/l2/mrst/cist/brg
CIST Bridge Configuration

```
[CIST Bridge Menu]
      prior   - Set CIST bridge Priority (0-65535)
      mxage   - Set CIST bridge Max Age (6-40 secs)
      fwd     - Set CIST bridge Forward Delay (4-30 secs)
      cur     - Display current CIST bridge parameters
```

CIST bridge parameters are used only when the switch is in MSTP mode. CIST parameters do not affect operation of STP/PVST+.

Table 176   CIST Bridge Configuration Options

Command Syntax and Usage

prior *<0-65535>*

Configures the CIST bridge priority. The bridge priority parameter controls which bridge on the network is the MSTP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority.

The range is 0 to 65535, in steps of 4096 (0, 4096, 8192...). The default value is 32768.

mxage *<6-40 seconds>*

Configures the CIST bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the MSTP network. The range is 6 to 40 seconds, and the default is 20 seconds.

fwd *<4-30 seconds>*

Configures the CIST bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds.

cur

Displays the current CIST bridge configuration.

/cfg/l2/mrst/cist/port *<port alias or number>*
CIST Port Configuration

```
[CIST Port 1 Menu]
   prior   - Set port Priority (0-240)
   cost    - Set port Path Cost (1-200000000, 0 for auto)
   hello   - Set CIST port Hello Time (1-10 secs)
   pvst-pro - Enable/disable PVST Protection (for MSTP only)
   on      - Turn port's Spanning Tree ON
   off     - Turn port's Spanning Tree OFF
   cur     - Display current port Spanning Tree parameters
```

CIST port parameters are used to modify MRST operation on an individual port basis. CIST parameters do not affect operation of STP/PVST+, RSTP, or PVRST+. For each port, RSTP/MSTP is turned on by default.

Table 177 CIST Port Configuration Options

Command Syntax and Usage

prior *<0-240>*

Configures the CIST port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment. The range is 0 to 240, in steps of 16 (0, 16, 32...), and the default is 128.

cost *<0-200000000>*

Configures the CIST port path cost. The port path cost is used to help determine the designated port for a segment. Port path cost is based on the port speed, and is calculated as follows:

□   100Mbps = 200000

□   1Gbps = 20000

□   10Gbps = 2000

The default value of 0 (zero) indicates that the default path cost will be computed for an auto negotiated link speed.

hello *<1-10 seconds>*

Configures the CIST port Hello time.The Hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge Hello value. The range is 1 to 10 seconds, and the default is 2 seconds.

Table 177 CIST Port Configuration Options

Command Syntax and Usage

pvst-pro e|d

Configures PVST Protection on the selected port. If the port receives any PVST+/PVRST+ BPDUs, it error disabled. PVST Protection works only in MSTP mode. The default setting is `enabled`.

on

Enables MRST on the port.

off

Disables MRST on the port.

cur

Displays the current CIST port configuration.

`/cfg/l2/stp` *<STP group index>*
Spanning Tree Configuration

```
[Spanning Tree Group 1 Menu]
     brg    - Bridge parameter menu
     port   - Port parameter menu
     add    - Add VLAN(s) to Spanning Tree Group
     remove - Remove VLAN(s) from Spanning Tree Group
     clear  - Remove all VLANs from Spanning Tree Group
     on     - Globally turn Spanning Tree ON
     off    - Globally turn Spanning Tree OFF
     default - Default Spanning Tree and Member parameters
     cur    - Display current bridge parameters
```

BLADEOS supports the IEEE 802.1D Spanning Tree Protocol (STP). STP is used to prevent loops in the network topology. Up to 128 Spanning Tree Groups can be configured on the switch.

Note – When VRRP is used for active/active redundancy, STP must be turned on.

Table 178 Spanning Tree Configuration Options

Command Syntax and Usage

brg

Displays the Bridge Spanning Tree menu. To view menu options, see page 318.

port *<port alias or number>*

Displays the Spanning Tree Port menu. To view menu options, see page 320.

add *<VLAN number>*

Associates a VLAN with a spanning tree and requires a VLAN ID as a parameter.

remove *<VLAN number>*

Breaks the association between a VLAN and a spanning tree and requires a VLAN ID as a parameter.

clear

Removes all VLANs from a spanning tree.

on

Globally enables Spanning Tree Protocol. STG is turned on by default.

off

Globally disables Spanning Tree Protocol.

Table 178   Spanning Tree Configuration Options

Command Syntax and Usage

default

   Restores a spanning tree instance to its default configuration.

cur

   Displays current Spanning Tree Protocol parameters.

/cfg/l2/stp *<STP group number>*/brg
Spanning Tree Bridge Configuration

```
[Bridge Spanning Tree Menu]
      prior   - Set bridge Priority [0-65535]
      hello   - Set bridge Hello Time [1-10 secs]
      mxage   - Set bridge Max Age (6-40 secs)
      fwd     - Set bridge Forward Delay (4-30 secs)
      cur     - Display current bridge parameters
```

Spanning Tree bridge parameters affect the global STG operation of the switch. STG bridge parameters include:

- Bridge priority
- Bridge hello time
- Bridge maximum age
- Forwarding delay

Table 179 Spanning Tree Bridge Options

Command Syntax and Usage

`prior` *<new bridge priority (0-65535)>*

Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STG root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority. The default value is 65534.

RSTP/MSTP: The range is 0 to 61440, in steps of 4096 (0, 4096, 8192...), and the default is 61440.

`hello` *<new bridge hello time (1-10 secs)>*

Configures the bridge hello time.The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. The range is 1 to 10 seconds, and the default is 2 seconds.

This command does not apply to MSTP (see CIST on page 313).

`mxage` *<new bridge max age (6-40 secs)>*

Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it re configures the STG network. The range is 6 to 40 seconds, and the default is 20 seconds.

This command does not apply to MSTP (see CIST on page 313).

`fwd` *<new bridge Forward Delay (4-30 secs)>*

Configures the bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds.

This command does not apply to MSTP (see CIST on page 313).

`cur`

Displays the current bridge STG parameters.

When configuring STG bridge parameters, the following formulas must be used:

- $2*(fwd\text{-}1) \geq mxage$
- $2*(hello\text{+}1) \leq mxage$

/cfg/l2/stp *<STP Group Index>*/port *<port alias or number>*
Spanning Tree Port Configuration

```
[Spanning Tree Port 1 Menu]
  prior    - Set port Priority (0-255)
  cost     - Set port Path Cost (1-65535 (802.1d) /
             1-200000000 (MSTP/RSTP) /0 for auto)
  fastfwd  - Enable/disable Port Fast Forwarding mode
  on       - Turn port's Spanning Tree ON
  off      - Turn port's Spanning Tree OFF
  cur      - Display current port Spanning Tree parameters
```

By default for STP/PVST+, Spanning Tree is turned **on** for data ports. By default for RSTP/MSTP, Spanning Tree is turned **on** for data ports. STG port parameters include:

- Port priority
- Port path cost

For more information about port Spanning Tree commands, see "Port Spanning Tree Configuration" on page 272.

Table 180   Spanning Tree Port Options

Command Syntax and Usage

prior *<new port Priority (0-255)>*

Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment. The default value is 128.
RSTP/MSTP: The range is 0 to 240, in steps of 16 (0, 16, 32...).

Note: In Stacking mode, the range is 0-255, in steps of 4 (0, 4, 8, 12...).

cost *<1-65535, 0 for default)>*

Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Port path cost is based on the port speed, and is calculated as follows:

- □ 100Mbps = 19
- □ 1Gbps = 4
- □ 10Gbps = 2

The default value of 0 (zero) indicates that the default path cost will be computed for an auto negotiated link speed.

Table 180 Spanning Tree Port Options

Command Syntax and Usage

fastfwd enable|disable

Disables or enables Port Fast Forwarding, which permits a port that participates in Spanning Tree to bypass the Listening and Learning states and enter directly into the Forwarding state. While in the Forwarding state, the port listens to the BPDUs to learn if there is a loop and, if dictated by normal STG behavior (following priorities, etc.), the port transitions into the Blocking state.

Note: This feature is used only when the switch is in STP/PVST+ mode, and permits the switch to interoperate well within Rapid Spanning Tree networks.

The default setting is disabled.

on

Enables STG on the port.

off

Disables STG on the port.

cur

Displays the current STG port parameters.

`/cfg/l2/fdb`
Forwarding Database Configuration

```
[FDB Menu]
     mcast    - Static Multicast Menu
     static   - Static FDB Menu
     aging    - Configure FDB aging value
     cur      - Display current FDB configuration
```

Use the following commands to configure the Forwarding Database (FDB) for the G8000.

Table 181   FDB Configuration Options

Command Syntax and Usage

mcast

Displays the static Multicast menu. To view menu options, see page 323.

static

Displays the static FDB menu. To view menu options, see page 324.

aging *<0-65535>*

Configures the aging value for FDB entries, in seconds. The default value is 300.

cur

Displays the current FDB parameters.

/cfg/l2/fdb/mcast
Static Multicast MAC Configuration

```
[Static Multicast Menu]
     add      - Add a Multicast Address entry
     del      - Delete a Multicast Address entry
     clear    - Clear all Multicast Address entries
     cur      - Display current Multicast Address configuration
```

The following options are available to control the forwarding of known and unknown multicast packets:

■ All multicast packets are flooded to the entire VLAN. This is the default switch behavior.

■ Known multicast packets are forwarded only to those ports specified. Unknown multicast packets are flooded to the entire VLAN. To configure this option, define the Multicast MAC address for the VLAN and specify ports that are to receive multicast packets (**/cfg/l2/fdb/mcast/add**).

■ Known multicast packets are forwarded only to those ports specified. Unknown multicast packets are dropped. To configure this option:

 □ Define the Multicast MAC address for the VLAN and specify ports that are to receive multicast packets (**/cfg/l2/fdb/mcast/add**).

 □ Enable Flood Blocking on ports that are not to receive multicast packets (**/cfg/port** *x***/floodblk ena**).

Use the following commands to configure static Multicast MAC entries in the Forwarding Database (FDB).

Table 182 Static Multicast MAC Options

Command Syntax and Usage

add *<MAC address> <VLAN number> <port alias or number>*

Adds a static multicast entry. You can list ports separated by a space, or enter a range of ports separated by a hyphen (-). For example:

add 01:00:00:23:3f:01 200 int1-int4

del *<MAC address> <VLAN number>*

Deletes a static multicast entry.

Table 182   Static Multicast MAC Options

Command Syntax and Usage

clear {all|mac *<MAC address>***|vlan** *<VLAN number>***|**
  port *<port alias or number>***}**

Clears static multicast entries.

---

cur

Display current static multicast entries.

/cfg/l2/fdb/static
Static FDB Configuration

```
[Static FDB Menu]
     add       - Add a permanent FDB entry
     del       - Delete a static FDB entry
     clear     - Clear static FDB entries
     cur       - Display current static FDB configuration
```

Use the following commands to configure static entries in the Forwarding Database (FBD).

Table 183   Static FDB Configuration Options

Command Syntax and Usage

add *<MAC address>* *<VLAN number>* **{port** *<port alias or number>***|**
  trunk *<trunk group number>***|adminkey** *<value>***}**

Adds a permanent FDB entry. Enter the MAC address using the following format:
xx:xx:xx:xx:xx:xx

For example, 08:00:20:12:34:56

You can also enter the MAC address as follows:
xxxxxxxxxxxx

For example, 080020123456

---

del *<MAC address>* *<VLAN number>*

Deletes a permanent FDB entry.

Table 183   Static FDB Configuration Options

Command Syntax and Usage

clear *<MAC address>***|all {mac|vlan|port}**

Clears static FDB entries.

cur

Display current static FDB configuration.

/cfg/l2/lldp
LLDP Configuration

```
[LLDP configuration Menu]
     port     - LLDP Port Menu
     msgtxint - Set transmission interval for LLDPDU
     msgtxhld - Set holdtime multiplier for LLDP advertisement
     notifint - Set minimum interval for successive trap notification
     txdelay  - Set delay interval between LLDP advertisements
     redelay  - Set reinitialization delay interval
     on       - Globally turn LLDP On
     off      - Globally turn LLDP Off
     cur      - Show current LLDP parameters
```

Use the following commands to configure Link Layer Detection Protocol (LLDP).

Table 184   LLDP Configuration Options

Command Syntax and Usage

port *<port alias or number>*

Displays the LLDP Port Configuration menu. To view menu options, see .

msgtxint *<5-32768>*

Configures the message transmission interval, in seconds. The default value is 30.

msgtxhld *<2-10>*

Configures the message hold time multiplier. The hold time is configured as a multiple of the message transmission interval.

The default value is 4.

notifint *<1-3600>*

Configures the trap notification interval, in seconds. The default value is 5.

Table 184 LLDP Configuration Options

Command Syntax and Usage

txdelay *<1-8192>*

Configures the transmission delay interval. The transmit delay timer represents the minimum time permitted between successive LLDP transmissions on a port.

The default value is 2.

redelay *<1-10>*

Configures the re-initialization delay interval, in seconds. The re-initialization delay allows the port LLDP information to stabilize before transmitting LLDP messages.

The default value is 2.

on

Globally turns LLDP on. The default setting is **on**.

off

Globally turns LLDP off.

cur

Display current LLDP configuration.

/cfg/l2/lldp/port *<port alias or number>*
LLDP Port Configuration

```
[LLDP Port 2 Menu]
     admstat  - Set LLDP admin-status of this port
     snmptrap - Enable/disable SNMP trap notification of this port
     tlv      - Optional TLVs Menu
     cur      - Show current LLDP port parameters
```

Use the following commands to configure LLDP port options.

Table 185 LLDP Port Configuration Options

Command Syntax and Usage

`admstat disabled|tx_only|rx_only|tx_rx`

Configures the LLDP transmission type for the port, as follows:

- □ Transmit only
- □ Receive only
- □ Transmit and receive
- □ Disabled

The default value is tx_rx.

`snmptrap e|d`

Enables or disables SNMP trap notification for LLDP messages.

`tlv`

Displays the Optional TLV menu for the selected port. To view menu options, see .

`cur`

Display current LLDP configuration.

`/cfg/l2/lldp/port` *<port alias or number>***`/tlv`**
LLDP Optional TLV Configuration

```
[Optional TLVs Menu]
portdesc - Enable/disable Port Description TLV for this port
sysname  - Enable/disable System Name TLV for this port
sysdescr - Enable/disable System Description TLV for this port
syscap   - Enable/disable System Capabilities TLV for this port
mgmtaddr - Enable/disable Management Address TLV for this port
portvid  - Enable/disable Port VLAN ID TLV for this port
portprot - Enable/disable Port and Protocol VLAN ID TLV for this port
vlanname - Enable/disable VLAN Name TLV for this port
protid   - Enable/disable Protocol Identity TLV for this port
macphy   - Enable/disable MAC/PHY Configuration/Status TLV for this port
powermdi - Enable/disable Power Via MDI TLV for this port
linkaggr - Enable/disable Link Aggregation TLV for this port
framesz  - Enable/disable Maximum Frame Size TLV for this port
all      - Enable/disable all the Optional TLVs for this port
cur      - Display current Optional TLVs configuration
```

Use the following commands to configure LLDP port TLV (Type, Length, Value) options for the selected port.

Table 186 Optional TLV Options

Command Syntax and Usage

portdesc d|e

Enables or disables the Port Description information type.

sysname d|e

Enables or disables the System Name information type.

sysdescr d|e

Enables or disables the System Description information type.

syscap d|e

Enables or disables the System Capabilities information type.

mgmtaddr d|e

Enables or disables the Management Address information type.

portvid d|e

Enables or disables the Port VLAN ID information type.

portprot d|e

Enables or disables the Port and VLAN Protocol ID information type.

vlanname d|e

Enables or disables the VLAN Name information type.

protid d|e

Enables or disables the Protocol ID information type.

macphy d|e

Enables or disables the MAC/Phy Configuration information type.

powermdi d|e

Enables or disables the Power via MDI information type.

linkaggr d|e

Enables or disables the Link Aggregation information type.

Table 186   Optional TLV Options

Command Syntax and Usage

framesz d|e

Enables or disables the Maximum Frame Size information type.

all d|e

Enables or disables all optional TLV information types.

cur

Display current Optional TLV configuration.

/cfg/l2/trunk *<trunk group number>*
Trunk Configuration

```
[Trunk group 1 Menu]
      add      - Add port to trunk group
      rem      - Remove port from trunk group
      ena      - Enable trunk group
      dis      - Disable trunk group
      del      - Delete trunk group
      cur      - Display current Trunk Group configuration
```

Trunk groups can provide super-bandwidth connections between G8000s or other trunk capable devices. A *trunk* is a group of ports that act together, combining their bandwidth to create a single, larger port. Up to 52 trunk groups can be configured on the G8000, with the following restrictions:

- Any physical switch port can belong to no more than one trunk group.
- Up to 8 ports can belong to the same trunk group.
- Configure all ports in a trunk group with the same properties (speed, duplex, flow control, STG, VLAN, and so on).
- Trunking from non-BLADE devices must comply with Cisco® EtherChannel® technology.

By default, each trunk group is empty and disabled.

Table 187   Trunk Configuration Options

Command Syntax and Usage

add *<port alias or number>*

Adds a physical port or ports to the current trunk group. You can add several ports, with each port separated by a comma (,) or a range of ports, separated by a dash (-).

rem *<port alias or number>*

Removes a physical port or ports from the current trunk group.

ena

Enables the current trunk group.

dis

Disables the current trunk group.

del

Removes the current trunk group configuration.

cur

Displays current trunk group parameters.

/cfg/l2/thash
Trunk Hash Configuration

```
[IP Trunk Hash Menu]
     set      - IP Trunk Hash Settings Menu
     ingress  - Enable/disable ingress port hash
     L4port   - Enable/disable L4 port hash
     cur      - Display current IP trunk hash configuration
```

Use the following commands to configure trunk hash settings for the G8000. Trunk hash parameters are set globally for the G8000. The trunk hash settings affect both static trunks and LACP trunks.

To achieve the most even traffic distribution, select options that exhibit a wide range of values for your particular network. You may use the configuration settings listed in Table 188 combined with the hash parameters listed in Table 189.

Table 188 Trunk Hash Settings

Command Syntax and Usage

set

Displays the Trunk Hash Settings menu. To view menu options, see page 332.

ingress e|d

Enables or disables trunk hash computation based on the ingress port. The default setting is disabled.

L4port e|d

Enables or disables use of Layer 4 service ports (TCP, UDP, and so on) to compute the hash value. The default setting is disabled.

cur

Display current trunk hash configuration.

/cfg/l2/thash/set
Trunk Hash Settings

```
[set IP Trunk Hash Settings Menu]
     smac     - Enable/disable smac hash
     dmac     - Enable/disable dmac hash
     sip      - Enable/disable sip hash
     dip      - Enable/disable dip hash
     cur      - Display current trunk hash setting
```

You can enable one or two of the following parameters, to configure any of the following valid combinations:

■ SMAC (source MAC only)

■ DMAC (destination MAC only)

■ SIP (source IP only)

■ DIP (destination IP only)

■ SIP + DIP (source IP and destination IP)

■ SMAC + DMAC (source MAC and destination MAC)

Use the following commands to configure trunk hash parameters for the G8000.

Table 189 Trunk Hash Parameters

Command Syntax and Usage

smac enable|disable

Enable or disable trunk hashing on the source MAC.

dmac enable|disable

Enable or disable trunk hashing on the destination MAC.

sip enable|disable

Enable or disable trunk hashing on the source IP.

dip enable|disable

Enable or disable trunk hashing on the destination IP.

cur

Display current trunk hash setting.

`/cfg/l2/lacp`
LACP Configuration

```
[LACP Menu]
     port     - LACP Port Menu
     sysprio  - Set LACP system priority
     timeout  - Set LACP system timeout scale for timing out partner
                info
     delete   - Delete an LACP trunk
     default  - Restore default LACP system configuration
     cur      - Display current LACP configuration
```

Use the following commands to configure Link Aggregation Control Protocol (LACP) for the G8000.

Table 190 LACP Configuration Options

Command Syntax and Usage

port *<port alias or number>*

Displays the LACP Port menu. To view menu options, see .

sysprio *<1-65535>*

Defines the priority value (1 through 65535) for the G8000. Lower numbers provide higher priority. The default value is 32768.

timeout short|long

Defines the timeout period before invalidating LACP data from a remote partner. Choose **short** (3 seconds) or **long** (90 seconds). The default value is **long**.

Note: It is recommended that you use a timeout value of **long**, to reduce LACPDU processing. If your G8000's CPU utilization rate remains at 100% for periods of 90 seconds or more, consider using static trunks instead of LACP.

delete *<1-65535>*

Deletes a selected LACP trunk, based on its *admin key.* This command is equivalent to disabling LACP on each of the ports configured with the same *admin key.*

default sysprio|timeout

Restores the selected parameters to their default values.

cur

Display current LACP configuration.

/cfg/l2/lacp/port *<port alias or number>*
LACP Port Configuration

```
[LACP Port 1 Menu]
     mode    - Set LACP mode
     prio    - Set LACP port priority
     adminkey - Set LACP port admin key
     default - Restore default LACP port configuration
     cur     - Display current LACP port configuration
```

Use the following commands to configure Link Aggregation Control Protocol (LACP) for the selected port.

Table 191 LACP Port Options

Command Syntax and Usage

mode off|active|passive

Set the LACP mode for this port, as follows:

☐ off: Turn LACP off for this port. You can use this port to manually configure a static trunk. The default value is off.

☐ active: Turn LACP on and set this port to active. Active ports initiate LACPDUs.

☐ passive: Turn LACP on and set this port to passive. Passive ports do not initiate LACPDUs, but respond to LACPDUs from active ports.

prio *<1-65535>*

Sets the priority value for the selected port. Lower numbers provide higher priority. The default value is 32768.

adminkey *<1-65535>*

Set the admin key for this port. Only ports with the same *admin key* and *oper key* (operational state generated internally) can form a LACP trunk group.

default adminkey|mode|prio

Restores the selected parameters to their default values.

cur

Displays the current LACP configuration for this port.

/cfg/l2/failovr
Layer 2 Failover Configuration

```
[Failover Menu]
     trigger  - Trigger Menu
     on       - Globally turn Failover ON
     off      - Globally turn Failover OFF
     cur      - Display current Failover configuration
```

Use this menu to configure Layer 2 Failover. For more information about Layer 2 Failover, see
"High Availability" in the *BLADEOS Application Guide*.

Table 192   Layer 2 Failover Configuration Options

Command Syntax and Usage

trigger *<1-8>*

Displays the Failover Trigger menu. To view menu options, see .

on

Globally turns Layer 2 Failover on.

off

Globally turns Layer 2 Failover off.

cur

Displays current Layer 2 Failover parameters.

/cfg/l2/failovr/trigger *<1-8>*
Failover Trigger Configuration

```
[Trigger 1 Menu]
     mmon      - Manual Monitor Menu
     limit     - Limit of Trigger
     ena       - Enable Trigger
     dis       - Disable Trigger
     del       - Delete Trigger
     cur       - Display current Trigger configuration
```

Table 193 Failover Trigger Options

Command Syntax and Usage

mmon

Displays the Manual Monitor menu for the selected trigger. To view menu options, see page 337.

limit *<0-1024>*

Configures the minimum number of operational links allowed within each trigger before the trigger initiates a failover event. If you enter a value of zero (0), the switch triggers a failover event only when no links in the trigger are operational.

ena

Enables the selected trigger.

dis

Disables the selected trigger.

del

Deletes the selected trigger.

cur

Displays the current failover trigger settings.

/cfg/l2/failovr/trigger/mmon
Manual Monitor Configuration

```
[Manual Monitor Menu]
     monitor   - Monitor Menu
     control   - Control Menu
     cur       - Display current Manual Monitor configuration
```

Use this menu to configure Failover Manual Monitor. These menus allow you to manually define both the monitor and control ports that participate in failover teaming.

Table 194   Failover Manual Monitor Options

Command Syntax and Usage

monitor

Displays the Manual Monitor - Monitor menu for the selected trigger.

control

Displays the Manual Monitor - Control menu for the selected trigger.

cur

Displays the current Manual Monitor settings.

`/cfg/l2/failovr/trigger/mmon/monitor`
Manual Monitor Port Configuration

```
[Monitor Menu]
     addport  - Add port to Monitor
     remport  - Remove port from Monitor
     addtrnk  - Add trunk to Monitor
     remtrnk  - Remove trunk from Monitor
     addkey   - Add LACP port adminkey to Monitor
     remkey   - Remove LACP port adminkey from Monitor
     cur      - Display current Monitor configuration
```

Use this menu to define the port link(s) to monitor. The Manual Monitor Port configuration accepts any non-management port.

Table 195　Failover Manual Monitor - Monitor Options

Command Syntax and Usage

addport *<port alias or number>*

Adds the selected port to the Manual Monitor Port configuration.

remport *<port alias or number>*

Removes the selected port from the Manual Monitor Port configuration.

addtrnk *<trunk number>*

Adds a trunk group to the Manual Monitor Port configuration.

remtrnk *<trunk number>*

Removes a trunk group from the Manual Monitor Port configuration.

addkey *<1-65535>*

Adds an LACP *admin key* to the Manual Monitor Port configuration. LACP trunks formed with this *admin key* will be included in the Manual Monitor Port configuration.

remkey *<1-65535>*

Removes an LACP *admin key* from the Manual Monitor Port configuration.

cur

Displays the current Manual Monitor Port configuration.

/cfg/l2/failovr/trigger/mmon/control
Manual Monitor Control Configuration

```
[Control Menu]
     addport  - Add port to Control
     remport  - Remove port from Control
     addtrnk  - Add trunk to Control
     remtrnk  - Remove trunk from Control
     addkey   - Add LACP port adminkey to Control
     remkey   - Remove LACP port adminkey from Control
     cur      - Display current Control configuration
```

Use this menu to define the port link(s) to control. The Manual Monitor Control configuration accepts any non-management port.

Table 196 Failover Manual Monitor - Control Options

Command Syntax and Usage

addport *<port alias or number>*

Adds the selected port to the Manual Monitor Control configuration.

remport *<port alias or number>*

Removes the selected port from the Manual Monitor Control configuration.

addtrnk *<trunk number>*

Adds a trunk group to the Manual Monitor Control configuration.

remtrnk *<trunk number>*

Removes a trunk group from the Manual Monitor Control configuration.

addkey *<1-65535>*

Adds an LACP *admin key* to the Manual Monitor Control configuration. LACP trunks formed with this *admin key* will be included in the Manual Monitor Control configuration.

remkey *<1-65535>*

Removes an LACP *admin key* from the Manual Monitor Control configuration.

cur

Displays the current Manual Monitor Control configuration.

/cfg/l2/hotlink
Hot Links Configuration

```
[Hot Links Menu]
     trigger  - Trigger Menu
     bpdu     - Enable/disable BPDU flood
     sndfdb   - Enable/disable FDB update
     on       - Globally turn Hot Links ON
     off      - Globally turn Hot Links OFF
     cur      - Display current Hot Links configuration
```

Table 197 describes the Hot Links menu options.

Table 197   Hot Links Configuration Options

Command Syntax and Usage

trigger *<1-25>*

Displays the Hot Links Trigger menu. To view menu options, see page 341.

bpdu enable|disable

Enables or disables flooding of Spanning-Tree BPDUs on the active Hot Links interface when the interface belongs to a Spanning Tree group that is globally turned off. This feature can prevent unintentional loop scenarios (for example, if two uplinks come up at the same time).

The default setting is disabled.

sndfdb enable|disable

Enables or disables FDB Update, which allows the switch to send FDB and MAC update packets over the active interface.

The default setting is disabled.

on

Globally turns Hot Links on. The default value is off.

off

Globally turns Hot Links off.

cur

Displays current Hot Links configuration.

/cfg/l2/hotlink/trigger *<1-200>*
Hot Links Trigger Configuration

```
[Trigger 2 Menu]
    master   - Master Menu
    backup   - Backup Menu
    fdelay   - Set Forward Delay (secs)
    name     - Set Trigger Name
    preempt  - Enable/disable Preemption
    ena      - Enable Trigger
    dis      - Disable Trigger
    del      - Delete Trigger
    cur      - Display current Trigger configuration
```

Table 198   Hot Links Trigger Options

Command Syntax and Usage

master

Displays the Master interface menu for the selected trigger. To view menu options, see page 342.

backup

Displays the Backup interface menu for the selected trigger. To view menu options, see page 343.

fdelay *<0-3600>*

Configures the Forward Delay interval, in seconds. The default value is 1.

name *<1-32 characters>*

Configures a name for the trigger.

preempt e|d

Enables or disables pre-emption, which allows the Master interface to transition to the Active state whenever it becomes available.

The default setting is enabled.

ena

Enables the Hot Links trigger.

dis

Disables the Hot Links trigger.

Table 198   Hot Links Trigger Options

Command Syntax and Usage

del

Deletes the Hot Links trigger.

cur

Displays the current Hot Links Trigger configuration.

/cfg/l2/hotlink/trigger *<1-200>*/master
Hot Links Trigger Master Configuration

```
[Master Menu]
    port    - Set port in Master
    trunk   - Set trunk in Master
    adminkey - Set adminkey in Master
    cur     - Display current Master configuration
```

Table 199   Hot Links Trigger Master Options

Command Syntax and Usage

port *<port name or alias>*

Adds the selected port to the Master interface. Enter 0 (zero) to clear the port.

trunk *<trunk number>*

Adds the selected trunk group to the Master interface. Enter 0 (zero) to clear the trunk group.

adminkey *<0-65535>*

Adds an LACP *admin key* to the Master interface. LACP trunks formed with this *admin key* will be included in the Master interface. Enter 0 (zero) to clear the *admin key*.

cur

Displays the current Hot Links Master interface configuration.

/cfg/l2/hotlink/trigger *<1-200>*/backup
Hot Links Trigger Backup Configuration

```
[Backup Menu]
    port     - Set port in Backup
    trunk    - Set trunk in Backup
    adminkey - Set adminkey in Backup
    cur      - Display current Backup configuration
```

Table 200 Hot Links Trigger Backup Options

Command Syntax and Usage

port *<port alias or number>*

Adds the selected port to the Backup interface. Enter 0 (zero) to clear the port.

trunk *<trunk number>*

Adds the selected trunk to the Backup interface. Enter 0 (zero) to clear the trunk group.

adminkey *<0-65535>*

Adds an LACP *admin key* to the Backup interface. LACP trunks formed with this *admin key* will be included in the Backup interface. Enter 0 (zero) to clear the *admin key*.

cur

Displays the current Hot Links Backup interface settings.

/cfg/l2/vlan *<VLAN number>*
VLAN Configuration

```
[VLAN 1 Menu]
    pvlan    - Protocol VLAN Menu
    privlan  - Private-VLAN Menu
    name     - Set VLAN name
    stg      - Assign VLAN to a Spanning Tree Group
    vmap     - Set VMAP for this vlan
    add      - Add port to VLAN
    rem      - Remove port from VLAN
    def      - Define VLAN as list of ports
    ena      - Enable VLAN
    dis      - Disable VLAN
    del      - Delete VLAN
    cur      - Display current VLAN configuration
```

The commands in this menu configure VLAN attributes, change the status of each VLAN, change the port membership of each VLAN, and delete VLANs.

By default, VLAN 1 is the only VLAN configured on the switch. All ports are members of VLAN 1 by default. Up to 1024 VLANs can be configured on the G8000.

VLANs can be assigned any number between 1 and 4094.

Table 201   VLAN Configuration Options

Command Syntax and Usage

pvlan *<1-8>*

Displays the Protocol-based VLAN menu. To view menu options, see page 346.

privlan

Displays the Private VLAN menu. To view menu options, see page 348.

name

Assigns a name to the VLAN or changes the existing name. The default VLAN name is the first one.

stg *<Spanning Tree Group index>*

Assigns a VLAN to a Spanning Tree Group.

Table 201   VLAN Configuration Options

Command Syntax and Usage

vmap {add|rem} *<1-127>* **[serverports|non-serverports]**

Adds or removes a VLAN Map to the VLAN membership. You can choose to limit operation of the VLAN Map to server ports only or non-server ports only. If you do not select a port type, the VMAP is applied to the entire VLAN.

add *<port alias or number>*

Adds port(s) to the VLAN membership.

rem *<port alias or number>*

Removes port(s) from this VLAN.

def *<list of port numbers>*

Defines which ports are members of this VLAN. Every port must be a member of at least one VLAN. By default, all ports are members of VLAN 1.

ena

Enables this VLAN.

dis

Disables this VLAN without removing it from the configuration.

del

Deletes this VLAN.

cur

Displays the current VLAN configuration.

Note – All ports must belong to at least one VLAN. Any port which is removed from a VLAN and which is not a member of any other VLAN is automatically added to default VLAN 1. You cannot remove a port from VLAN 1 if the port has no membership in any other VLAN. Also, you cannot add a port to more than one VLAN unless the port has VLAN tagging turned on (see the tag command on page 264).

/cfg/l2/vlan/pvlan *<protocol number>*
Protocol-Based VLAN Configuration

```
[VLAN 1 Protocol 1 Menu]
    pty      - Set protocol type
    protocol - Select a predefined protocol
    prio     - Set priority to protocol
    add      - Add port to PVLAN
    rem      - Remove port from PVLAN
    ports    - Add/Remove a list of ports to/from PVLAN
    tagpvl   - Enable/Disable port tagging for PVLAN
    taglist  - Enable tagging a port list for PVLAN
    ena      - Enable protocol
    dis      - Disable protocol
    del      - Delete protocol
    cur      - Display current PVLAN configuration
```

Use this menu to configure Protocol-based VLAN (PVLAN) for the selected VLAN.

Table 202 PVLAN Configuration Options

Command Syntax and Usage

pty *<(Ether2|SNAP|LLC)>* *<Ethernet type>*

Configures the frame type and the Ethernet type for the selected protocol. Ethernet type consists of a 4-digit (16 bit) hex code, such as `0080` (IPv4).

protocol *<Protocol type>*

Selects a pre-defined protocol, as follows:

- `decEther2:` DEC Local Area Transport
- `ipv4Ether2:` Internet IP (IPv4)
- `ipv6Ether2:` IPv6
- `ipx802.2:` Novell IPX 802.2
- `ipx802.3:` Novell IPX 802.3
- `ipxEther2:` Novell IPX
- `ipxSnap:` Novell IPX SNAP
- `netbios:` NetBIOS 802.2
- `rarpEther2:` Reverse ARP
- `sna802.2:` SNA 802.2
- `snaEther2:` IBM SNA Service on Ethernet
- `vinesEther2:` Banyan VINES
- `xnsEther2:` XNS Compatibility

Table 202 PVLAN Configuration Options

prio *<0-7>*

Configures the priority value for this PVLAN.

add *<port alias or number>*

Adds a port to the selected PVLAN.

rem *<port alias or number>*

Removes a port from the selected PVLAN.

ports *<port alias or number, or a list or range of ports>*

Defines a list of ports that belong to the selected protocol on this VLAN. Enter 0 (zero) to remove all ports.

tagpvl enable|disable

Enables or disables port tagging on this PVLAN.

taglist {*<port alias or number, or a list or range of ports>***|empty}**

Defines a list of ports that will be tagged by the selected protocol on this VLAN. Enter empty to disable tagging on all ports by this PVLAN.

ena

Enables the selected protocol on the VLAN.

dis

Disables the selected protocol on the VLAN.

del

Deletes the selected protocol configuration from the VLAN.

cur

Displays current parameters for the selected PVLAN.

`/cfg/l2/vlan/privlan`
Private VLAN Configuration

```
[privlan Menu]
    type     - Set Private-VLAN type
    map      - Associate secondary VLAN with a primary VLAN
    ena      - Enable Private-VLAN
    dis      - Disable Private-VLAN
    cur      - Display current Private-VLAN configuration
```

Use this menu to configure a Private VLAN.

Table 203 Private VLAN Configuration Options

Command Syntax and Usage

`type {none|primary|isolated|community}`

Defines the VLAN type, as follows:

- □ `none`: Clears the Private VLAN type.
- □ `primary`: A Private VLAN must have only one primary VLAN. The primary VLAN carries unidirectional traffic to ports on the isolated VLAN or to community VLAN.
- □ `isolated`: The isolated VLAN carries unidirectional traffic from host ports. A Private VLAN may have only one isolated VLAN.
- □ `community`: Community VLANs carry upstream traffic from host ports. A Private VLAN may have multiple community VLANs.

`map` *<2-4094>*`|none`

Configures Private VLAN mapping between a secondary VLAN (`isolated` or `community`) and a primary VLAN. Enter the primary VLAN ID.

`ena`

Enables the Private VLAN.

`dis`

Disables the Private VLAN.

`cur`

Displays current parameters for the selected Private VLAN.

/cfg/l3
Layer 3 Configuration Menu

```
[Layer 3 Menu]
    if       - Interface Menu
    gw       - Default Gateway Menu
    route    - Static Route Menu
    mroute   - Static IP Multicast Route Menu
    arp      - ARP Menu
    frwd     - Forwarding Menu
    nwf      - Network Filters Menu
    rmap     - Route Map Menu
    rip      - Routing Information Protocol Menu
    ospf     - Open Shortest Path First (OSPF) Menu
    bgp      - Border Gateway Protocol Menu
    igmp     - IGMP Menu
    dns      - Domain Name System Menu
    bootp    - Bootstrap Protocol Relay Menu
    vrrp     - Virtual Router Redundancy Protocol Menu
    gw6      - IP6 Default Gateway Menu
    route6   - Static IP6 Route Menu
    nbrcache - IP6 Static Neighbor Cache Menu
    ip6pmtu  - IP6 Path MTU Menu
    ospf3    - Open Shortest Path First v3 (OSPFv3) Menu
    ndprefix - IP6 Neighbor Discovery Prefix Menu
    ppt      - Prefix policy table Menu
    loopif   - Loopback Interface Menu
    rtrid    - Set router ID
    cur      - Display current IP configuration
```

Table 204 Layer 3 Configuration Menu Options

Command Syntax and Usage

if *<interface number (1-128>*

Displays the IP Interface menu. To view menu options, see page 352.

gw *<default gateway number (1-132)>*

Displays the IP Default Gateway menu. To view menu options, see page 356.

route

Displays the IP Static Route menu. To view menu options, see page 357.

mroute

Displays the Static IP Multicast Route menu. To view menu options, see page 359.

Table 204   Layer 3 Configuration Menu Options

Command Syntax and Usage

arp

Displays the Address Resolution Protocol menu. To view menu options, see page 361.

frwd

Displays the IP Forwarding menu. To view menu options, see page 363.

nwf   *<network filter number (1-256)>*

Displays the Network Filter Configuration menu. To view menu options see page 364.

rmap   *<route map number (1-32)>*

Displays the Route Map menu. To view menu options see page 365.

rip

Displays the Routing Interface Protocol menu. To view menu options, see page 369.

ospf

Displays the OSPF menu. To view menu options, see page 373.

bgp

Displays the Border Gateway Protocol menu. To view menu options, see page 385.

igmp

Displays the IGMP menu. To view menu options, see page 392.

dns

Displays the IP Domain Name System menu. To view menu options, see page 404.

bootp

Displays the Bootstrap Protocol menu. To view menu options, see page 405.

vrrp

Displays the Virtual Router Redundancy Configuration menu. To view menu options, see page 408.

gw6   *<gateway number (1 or 4)>*

Displays the IPv6 Gateway Configuration menu. To view menu options, see page 420.

route6

Displays the IPv6 Routing Configuration menu. To view menu options, see page 421.

Table 204   Layer 3 Configuration Menu Options

Command Syntax and Usage

nbrcache

Displays the IPv6 Neighbor Discovery Cache Configuration menu. To view menu options, see page 422.

ip6pmtu

Displays the IPv6 Path MTU menu. To view menu options, see page 423.

ospf3

Displays the OSPFv3 Configuration Menu. To view menu options, see page 424.

ndprefix

Displays the IPv6 Neighbor Discovery Prefix menu. To view menu options, see page 438.

ppt

Displays the Prefix Policy Table menu. To view menu options, see page 441.

loopif

Displays the IP Loopback Interface menu. To view menu options, see page 442.

rtrid *<IP address (such as, 192.4.17.101)>*

Sets the router ID.

cur

Displays the current IP configuration.

/cfg/l3/if *<interface number>*
IP Interface Configuration

```
[IP Interface 1 Menu]
     ip6nd   - IP6 Neighbor Discovery Menu
     addr    - Set IP address
     secaddr6 - Set Secondary IPv6 address on IPv6 interface
     maskplen - Set subnet mask/prefix len
     vlan    - Set VLAN number
     relay   - Enable/disable BOOTP relay
     ip6host - Enable/disable IPv6 host mode
     ip6dstun - Enable/disable ICMPv6 destination unreachable messages
     ena     - Enable IP interface
     dis     - Disable IP interface
     del     - Delete IP interface
     cur     - Display current interface configuration
```

The G8000 can be configured with up to 128 IP interfaces. Each IP interface represents the G8000 on an IP subnet on your network. The Interface option is disabled by default.

Table 205   IP Interface Configuration Options

Command Syntax and Usage

ip6nd

Displays the IPv6 Neighbor Discovery menu. To view menu options, see page 354.

addr   *<IPv4 address (such as 192.4.17.101)>*

IPv4: Configures the IPv4 address of the switch interface, using dotted decimal notation.

addr   *<IPv6 address (such as 3001:0:0:0:0:0:abcd:12)>* **[anycast]**

IPv6: Configures the IPv6 address of the switch interface, using hexadecimal format with colons.

secaddr6   *<IPv6 address (such as 3001:0:0:0:0:0:abcd:12)>|<prefix length>* **[anycast]**

Configures the secondary IPv6 address of the switch interface, using hexadecimal format with colons.

maskplen   *<IPv4 subnet mask (such as 255.255.255.0)>*

IPv4: Configures the IPv4 subnet address mask for the interface, using dotted decimal notation.

maskplen   *<IPv6 prefix length (1-128)>*

IPv6: Configures the subnet IPv6 prefix length. The default value is 0 (zero).

Table 205   IP Interface Configuration Options

Command Syntax and Usage

vlan *<VLAN number>*

Configures the VLAN number for this interface. Each interface can belong to only one VLAN.

IPv4: Each VLAN can contain multiple IPv4 interfaces.

IPv6: Each VLAN can contain only one IPv6 interface.

relay disable|enable

Enables or disables the BOOTP relay on this interface. The default setting is enabled.

ip6host enable|disable

Enables or disables the IPv6 Host Mode on this interface. The default setting is disabled for data interfaces, and enabled for the management interface.

ip6dstun enable|disable

Enables or disables sending of ICMP Unreachable messages. The default setting is enabled.

ena

Enables this IP interface.

dis

Disables this IP interface.

del

Removes this IP interface.

cur

Displays the current interface settings.

/cfg/l3/if *<interface number>*/ip6nd
IPv6 Neighbor Discovery Configuration

```
[IP6 Neighbor Discovery Menu]
    rtradv  - Enable/disable router advertisement
    managed - Enable/disable Managed config flag
    othercfg - Enable/disable Other config flag
    ralife  - Set Router Advertisement lifetime
    dad     - Set number of duplicate address detection attempts
    reachtm - Set advertised reachability time
    advint  - Set Router Advertisement maximum interval
    advmint - Set Router Advertisement minimum interval
    retimer - Set Router Advertisement Retrans Timer
    hoplmt  - Set Router Advertisement Hop Limit
    advmtu  - Enable/disable Advertise MTU option
    cur     - Display current Neighbor Discovery configuration
```

Table 206 describes the IPv6 Neighbor Discovery configuration options.

Table 206   IPv6 Neighbor Discovery Options

Command Syntax and Usage

rtradv e|d

Enables or disables IPv6 Router Advertisements on the interface. The default value is `disabled`.

managed e|d

Enables or disables the *managed address configuration* flag of the interface. When enabled, the host IP address can be set automatically through DHCP. The default value is `disabled`.

othercfg e|d

Enables or disables the *other stateful configuration* flag, which allows the interface to use DHCP for other stateful configuration. The default value is `disabled`.

ralife *<0-9000>*

Configures the IPv6 Router Advertisement lifetime interval. The RA lifetime interval must be greater than or equal to the RA maximum interval (`advint`), or 0 (zero).

The default value is 1800 seconds.

dad *<1-10>*

Configures the maximum number of duplicate address detection attempts. The default value is 1.

Table 206   IPv6 Neighbor Discovery Options

Command Syntax and Usage

`reachtm` *<0-3600>*
`reachtm` *<0-3600000>* `ms`

Configures the advertised reachability time, in seconds or milliseconds (ms). The default value is 30 seconds.

`advint` *<4-1800>*

Configures the Router Advertisement maximum interval. The default value is 600 seconds.

Note: Set the maximum RA interval to a value greater than or equal to 4/3 of the minimum RA interval.

`advmint` *<3-1800>*

Configures the Router Advertisement minimum interval. The default value is 198 seconds.

Note: Set the minimum RA interval to a value less than or equal to 0.75 of the maximum RA interval.

`retimer` *<0-4294967>*
`retimer` *<0-4294967295>* `ms`

Configures the Router Advertisement re-transmit timer, in seconds or milliseconds (ms). The default value is 1 second.

`hoplmt` *<0-255>*

Configures the Router Advertisement hop limit. The default value is 64.

`advmtu e|d`

Enables or disables the MTU option in Router Advertisements. The default setting is `enabled.`

`cur`

Displays the current Neighbor Discovery parameters.

`/cfg/l3/gw` *<gateway number>*
Default Gateway Configuration

```
[Default gateway 1 Menu]
      addr    - Set IP address
      intr    - Set interval between ping attempts
      retry   - Set number of failed attempts to declare gateway DOWN
      arp     - Enable/disable ARP only health checks
      ena     - Enable default gateway
      dis     - Disable default gateway
      del     - Delete default gateway
      cur     - Display current default gateway configuration
```

The switch can be configured with up to four IPv4 gateways.

This option is disabled by default.

Table 207   Default Gateway Configuration Options

Command Syntax and Usage

addr   *<default gateway address (such as, 192.4.17.44)>*

Configures the IP address of the default IP gateway using dotted decimal notation.

intr   *<0-60 seconds>*

The switch pings the default gateway to verify that it's up. The `intr` option sets the time between health checks. The range is from 0 to 60 seconds. The default is 2 seconds.

retry   *<number of attempts (1-120)>*

Sets the number of failed health check attempts required before declaring this default gateway inoperative. The range is from 1 to 120 attempts. The default is 8 attempts.

arp disable|**enable**

Enables or disables Address Resolution Protocol (ARP) health checks. The default value is **disabled**. The **arp** option does not apply to management gateways.

ena

Enables the gateway for use.

dis

Disables the gateway.

Table 207   Default Gateway Configuration Options

Command Syntax and Usage

del

Deletes the gateway from the configuration.

cur

Displays the current gateway settings.

`/cfg/l3/route`
IPv4 Static Route Configuration

```
[IP Static Route Menu]
     add     - Add static route
     rem     - Remove static route
     clear   - Clear static routes
     interval - Change ECMP route health check ping interval
     retries  - Change the number of retries for ECMP health check
     ecmphash - Choose ECMP hash mechanism sip/dipsip
     bgptoecmp - Enable/disable BGP to ECMP functionality
     cur     - Display current static routes
```

Up to 128 IPv4 static routes can be configured.

Table 208   IP Static Route Configuration Options

Command Syntax and Usage

add *<destination>* *<mask>* *<gateway>* [*<interface number>*]

Adds a static route. You will be prompted to enter a destination IP address, destination subnet mask, and gateway address. Enter all addresses using dotted decimal notation.

rem *<destination>* *<mask>* [*<interface number>*]

Removes a static route. The destination address of the route to remove must be specified using dotted decimal notation.

clear *<destination IP address>***|***<gateway IP address>***|all** *<value>*

Clears the selected IPv4 static routes.

interval *<1-60>*

Configures the ECMP health-check ping interval, in seconds. The default value is 1 second.

Table 208   IP Static Route Configuration Options

Command Syntax and Usage

retries *<1-60>*

 Configures the number of ECMP health-check retries. The default value is 3.

ecmphash [sip][dipsip]

Configures ECMP route hashing parameters. You may choose one of the following parameters:

☐   `sip`: Source IP address

☐   `dipsip`: Destination IP address and source IP address

bgptoecmp enable|disable

Enables or disables BGP to ECMP route selection. When enabled, the switch checks new BGP routes to see if there is an ECMP route with the same gateway as the new route. If one such route exists, then the switch adds a new ECMP route with the same paths but with the new destination.

When a new BGP route has the next hop in one of the subnets to which an ECMP static route exists, the switch adds that BGP route as a static ECMP route.

cur

Displays the current IPv4 static routes.

/cfg/l3/mroute
IP Multicast Route Configuration

```
[IPMC Static Route Menu]
     addport  - Add static IP Multicast route for port
     remport  - Remove static IP Multicast route for port
     addtrnk  - Add static IP Multicast route for trunk
     remtrnk  - Remove static IP Multicast route for trunk
     addkey   - Add static IP Multicast route for Lacp adminkey
     remkey   - Remove static IP Multicast route or Lacp adminkey
     cur      - Display current static IPMC route configuration
```

The following table describes the IP Multicast (IPMC) route menu options. Before you can add an IPMC route, IGMP must be turned on (**/cfg/l3/igmp on**), and IGMP Relay must be enabled (**/cfg/l3/igmp/relay ena**).

Table 209 IPMC Route Configuration Options

Command Syntax and Usage

addport *<IPMC destination>* *<VLAN number>* *<port alias or number>*
   primary|backup|host *<virtual router ID>*|**none**

Adds a static multicast route. You will be prompted to enter a destination IP address (in dotted decimal notation), VLAN, and member port. Indicate whether the route is used for a primary, backup, or host multicast router.

remport *<IPMC destination>* *<VLAN number>* *<port alias or number>*
   primary|backup|host *<virtual router ID>*|**none**

Removes a static multicast route. The destination address, VLAN, and member port of the route to remove must be specified.

addtrnk *<IPMC destination>* *<VLAN number>* *<trunk group number>*
   primary|backup|host *<virtual router ID>*|**none**

Adds a static multicast route. You will be prompted to enter a destination IP address (in dotted decimal notation), VLAN, and member trunk group. Indicate whether the route is used for a primary, backup, or host multicast router.

remtrnk *<IPMC destination>* *<VLAN number>* *<trunk group number>*
   primary|backup|host *<virtual router ID>*|**none**

Removes a static multicast route. The destination address, VLAN, and member trunk group of the route to remove must be specified.

Table 209 IPMC Route Configuration Options

Command Syntax and Usage

addkey *<IPMC destination>* *<VLAN number>* *<LACP adminkey>*
primary|**backup**|**host** *<virtual router ID>*|**none**

Adds a static multicast route. You will be prompted to enter a destination IP address (in dotted decimal notation), VLAN, and LACP adminkey. Indicate whether the route is used for a primary, backup, or host multicast router.

remkey *<IPMC destination>* *<VLAN number>* *<LACP adminkey>*
primary|backup|host *<virtual router ID>*|**none**

Removes a static multicast route. The destination address, VLAN, and LACP adminkey of the route to remove must be specified.

cur

Displays the current IP multicast routes.

`/cfg/l3/arp`
ARP Configuration

Address Resolution Protocol (ARP) is the TCP/IP protocol that resides within the Internet layer. ARP resolves a physical address from an IP address. ARP queries machines on the local network for their physical addresses. ARP also maintains IP to physical address pairs in its cache memory. In any IP communication, the ARP cache is consulted to see if the IP address of the computer or the router is present in the ARP cache. Then the corresponding physical address is used to send a packet.

```
[ARP Menu]
    static  - Static ARP Menu
    rearp   - Set re-ARP period in minutes
    cur     - Display current ARP configuration
```

Table 210 ARP Configuration Options

Command Syntax and Usage

static

Displays Static ARP menu. To view options, see page 362.

rearp *<2-120 minutes>*

Defines re-ARP period, in minutes. You can set this duration between 2 and 120 minutes. The default value is 5.

cur

Displays the current ARP configurations.

/cfg/l3/arp/static
ARP Static Configuration

Static ARP entries are permanent in the ARP cache and do not age out like the ARP entries that are learned dynamically. Static ARP entries enable the switch to reach the hosts without sending an ARP broadcast request to the network. Static ARPs are also useful to communicate with devices that do not respond to ARP requests. Static ARPs can also be configured on some gateways as a protection against malicious ARP Cache corruption and possible DOS attacks.

```
[Static ARP Menu]
     add       - Add a permanent ARP entry
     del       - Delete an ARP entry
     clear     - Clear static ARP entries
     cur       - Display current static ARP configuration
```

Table 211 ARP Static Configuration Options

Command Syntax and Usage

add *<IP address> <MAC address> <VLAN number> <port number>*

Adds a permanent ARP entry.

del *<IP address (such as, 192.4.17.101)>*

Deletes a permanent ARP entry.

clear [all|if *<interface number>*|**vlan** *<VLAN number>*|**port** *<port number>*]

Clears static ARP entries.

cur

Displays current static ARP configuration.

/cfg/l3/frwd
IP Forwarding Configuration

```
[IP Forwarding Menu]
     dirbr   - Enable or disable forwarding directed broadcasts
     noicmprd - Enable/disable No ICMP Redirects
     icmp6rd - Enable/disable ICMPv6 Redirects
     on      - Globally turn IP Forwarding ON
     off     - Globally turn IP Forwarding OFF
     cur     - Display current IP Forwarding configuration
```

Table 212   IP Forwarding Configuration Options

Command Syntax and Usage

dirbr disable|**enable**

Enables or disables forwarding directed broadcasts. The default setting is disabled.

noicmprd disable|enable

Enables or disables ICMP re-directs. The default setting is disabled.

icmp6rd disable|enable

Enables or disables IPv6 ICMP re-directs. The default setting is disabled.

on

Enables IP forwarding (routing) on the G8000. Forwarding is turned on by default.

off

Disables IP forwarding (routing) on the G8000.

cur

Displays the current IP forwarding settings.

/cfg/l3/nwf *<1-256>*
Network Filter Configuration

```
[IP Network Filter 1 Menu]
     addr   - IP Address
     mask   - IP network filter mask
     enable - Enable Network Filter
     disable - Disable Network Filter
     delete - Delete Network Filter
     cur    - Display current Network Filter configuration
```

Table 213 IP Network Filter Options

Command Syntax and Usage

addr *<IP address, such as 192.4.17.44>*

Sets the IP address that will be accepted by the peer when the filter is enabled. If used with the mask option, a range of IP addresses is accepted. The default address is 0.0.0.0

For Border Gateway Protocol (BGP), assign the network filter to an access-list in a route map, then assign the route map to the peer.

mask *<IP network filter mask>*

Sets the network filter mask that is used with addr. The default value is 0.0.0.0

For Border Gateway Protocol (BGP), assign the network filter to a route map, then assign the route map to the peer.

enable

Enables the Network Filter configuration.

disable

Disables the Network Filter configuration.

delete

Deletes the Network Filter configuration.

cur

Displays the current the Network Filter configuration.

/cfg/l3/rmap *<route map number>*
Routing Map Configuration

> **Note –** The *map number* (1-32) represents the routing map you wish to configure.

```
[IP Route Map 1 Menu]
      alist   - Access List number
      aspath  - AS Filter Menu
      ap      - Set as-path prepend of the matched route
      lp      - Set local-preference of the matched route
      metric  - Set metric of the matched route
      type    - Set OSPF metric-type of the matched route
      prec    - Set the precedence of this route map
      weight  - Set weight of the matched route
      enable  - Enable route map
      disable - Disable route map
      delete  - Delete route map
      cur     - Display current route map configuration
```

Routing maps control and modify routing information.

Table 214 Routing Map Configuration Options

Command Syntax and Usage

alist *<number 1-8>*

Displays the Access List menu. For more information, see page 367.

aspath *<number 1-8>*

Displays the Autonomous System (AS) Filter menu. For more information, see page 368.

ap *<AS number>* [*<AS number>*] [*<AS number>*]|**none**

Sets the AS path preference of the matched route. You can configure up to three path preferences.

lp *<(0-4294967294)>*|**none**

Sets the local preference of the matched route, which affects both inbound and outbound directions. The path with the higher preference is preferred.

metric *<(1-4294967294)>*|**none**

Sets the metric of the matched route.

Table 214 Routing Map Configuration Options

Command Syntax and Usage

type *<value (1 | 2)>* | **none**

Assigns the type of OSPF metric. The default is type 1.

- ☐ Type 1—External routes are calculated using both internal and external metrics.
- ☐ Type 2—External routes are calculated using only the external metrics. Type 1 routes have more cost than Type 2.
- ☐ none—Removes the OSPF metric.

prec *<value (1-255)>*

Sets the precedence of the route map. The smaller the value, the higher the precedence. Default value is 10.

weight *<value (0-65534)>* | **none**

Sets the weight of the route map.

enable

Enables the route map.

disable

Disables the route map.

delete

Deletes the route map.

cur

Displays the current route configuration.

`/cfg/l3/rmap` *<route map number>***`/alist`** *<access list number>*
IP Access List Configuration

> **Note –** The *route map number (*1-32) and the *access list number* (1-8) represent the IP access list you wish to configure.

```
[IP Access List 1 Menu]
     nwf     - Network Filter number
     metric  - Metric
     action  - Set Network Filter action
     enable  - Enable Access List
     disable - Disable Access List
     delete  - Delete Access List
     cur     - Display current Access List configuration
```

Table 215   IP Access List Options

Command Syntax and Usage

`nwf` *<network filter number (1-256)>*

Sets the network filter number. See "Network Filter Configuration" on page 364 for details.

`metric` *<(1-4294967294)>*|**`none`**

Sets the metric value in the AS-External (ASE) LSA.

`action permit`|**`deny`**

Permits or denies action for the access list.

`enable`

Enables the access list.

`disable`

Disables the access list.

`delete`

Deletes the access list.

`cur`

Displays the current Access List configuration.

/cfg/l3/rmap *<route map number>* /aspath *<autonomous system path>*
Autonomous System Filter Path

Note – The *rmap number (*1-32) and the *path number* (1-8) represent the AS path you wish to configure.

```
[AS Filter 1 Menu]
      as      - AS number
      action  - Set AS Filter action
      enable  - Enable AS Filter
      disable - Disable AS Filter
      delete  - Delete AS Filter
      cur     - Display current AS Filter configuration
```

Table 216   AS Filter Options

Command Syntax and Usage

as *<AS number (1-65535)>*

 Sets the Autonomous System filter's path number.

action *<permit | deny (p | d)>*

Permits or denies Autonomous System filter action.

enable

Enables the Autonomous System filter.

disable

Disables the Autonomous System filter.

delete

Deletes the Autonomous System filter.

cur

Displays the current Autonomous System filter configuration.

`/cfg/l3/rip`
Routing Information Protocol Configuration

```
[Routing Information Protocol Menu]
    if      - RIP Interface Menu
    update  - Set update period in seconds
    redist  - RIP Route Redistribute Menu
    on      - Globally turn RIP ON
    off     - Globally turn RIP OFF
    current - Display current RIP configuration
```

The RIP menu is used for configuring Routing Information Protocol (RIP) parameters. This option is turned off by default.

Table 217   RIP Configuration Options

Command Syntax and Usage

`if` *<interface number>*

Displays the RIP Interface menu. For more information, see .

`update` *<1-120>*

Configures the time interval for sending for RIP table updates, in seconds. The default value is 30 seconds.

`redist fixed|static|ospf|eospf|ebgp|ibgp`

Displays the RIP Route Redistribution menu. For more information, see .

`on`

Globally turns RIP **`on`**.

`off`

Globally turns RIP **`off`**.

`cur`

Displays the current RIP configuration.

`/cfg/l3/rip/if` *\<interface number\>*
Routing Information Protocol Interface Configuration

```
[RIP Interface 1 Menu]
     version  - Set RIP version
     supply   - Enable/disable supplying route updates
     listen   - Enable/disable listening to route updates
     poison   - Enable/disable poisoned reverse
     split    - Enable/disable split horizon
     trigg    - Enable/disable triggered updates
     mcast    - Enable/disable multicast updates
     default  - Set default route action
     metric   - Set metric
     auth     - Set authentication type
     key      - Set authentication key
     enable   - Enable interface
     disable  - Disable interface
     current  - Display current RIP interface configuration
```

The RIP interface menu is used for configuring Routing Information Protocol parameters for the selected interface.

Note – Do not configure RIP version 1 parameters if your routing equipment uses RIP version 2.

Table 218 RIP Interface Options

Command Syntax and Usage

version 1|**2**|**both**

Configures the RIP version used by this interface. The default value is version 2.

supply disable|**enable**

When enabled, the switch supplies routes to other routers. The default value is enabled.

listen disable|**enable**

When enabled, the switch learns routes from other routers. The default value is enabled.

poison disable|**enable**

When enabled, the switch uses split horizon with poisoned reverse. When disabled, the switch uses only split horizon. The default value is disabled.

split disable|**enable**

Enables or disables split horizon. The default value is enabled.

Table 218 RIP Interface Options

Command Syntax and Usage

trigg disable|enable

Enables or disables Triggered Updates. Triggered Updates are used to speed convergence. When enabled, Triggered Updates force a router to send update messages immediately, even if it is not yet time for the update message. The default value is `enabled`.

mcast disable|enable

Enables or disables multicast updates of the routing table (using address 224.0.0.9). The default value is `enabled`.

default none|listen|supply|both

When enabled, the switch accepts RIP default routes from other routers, but gives them lower priority than configured default gateways. When disabled, the switch rejects RIP default routes. The default value is `none`.

metric *<1-15>*

Configures the route metric, which indicates the relative distance to the destination. The default value is `1`.

auth none|password

Configures the authentication type. The default is `none`.

key *<password>***|none**

Configures the authentication key password.

enable

Enables this RIP interface.

disable

Disables this RIP interface.

current

Displays the current RIP configuration.

/cfg/l3/rip/redist fixed|static|ospf|eospf|ebgp|ibgp
RIP Route Redistribution Configuration

```
[RIP Redistribute Fixed Menu]
     add       - Add rmap into route redistribution list
     rem       - Remove rmap from route redistribution list
     export    - Export all routes of this protocol
     cur       - Display current route-maps added
```

The following table describes the RIP Route Redistribute menu options.

Table 219 RIP Redistribution Options

Command Syntax and Usage

add *<1-32>* *<1-32>*|**all**

Adds selected routing maps to the RIP route redistribution list. To add specific route maps, enter routing map numbers, separated by a comma (**,**). To add all 32 route maps, type **all**.

The routes of the redistribution protocol matched by the route maps in the route redistribution list will be redistributed.

rem *<1-32>* *<1-32>*|**all**

Removes the route map from the RIP route redistribution list.

To remove specific route maps, enter routing map numbers, separated by a comma (**,**). To remove all 32 route maps, type **all**.

export *<1-15>*|**none**

Exports the routes of this protocol in which the metric and metric type are specified. To remove a previous configuration and stop exporting the routes of the protocol, enter **none**.

cur

Displays the current RIP route redistribute configuration.

/cfg/l3/ospf
Open Shortest Path First Configuration

```
[Open Shortest Path First Menu]
      aindex  - OSPF Area (index) menu
      range   - OSPF Summary Range menu
      if      - OSPF Interface menu
      virt    - OSPF Virtual Links menu
      md5key  - OSPF MD5 Key Menu
      host    - OSPF Host Entry menu
      redist  - OSPF Route Redistribute menu
      lsdb    - Set the LSDB limit
      default - Originate default route information
      on      - Globally turn OSPF ON
      off     - Globally turn OSPF OFF
      cur     - Display current OSPF configuration
```

Table 220 OSPF Configuration Options

Command Syntax and Usage

aindex *<area index (0-2)>*

Displays the Area Index menu. This area index does not represent the actual OSPF area number. See page 375 to view menu options.

range *<1-16>*

Displays the summary range menu. See page 377 to view menu options.

if *<interface number>*

Displays the OSPF interface configuration menu. See page 378 to view menu options.

virt *<virtual link (1-3)>*

Displays the Virtual Links menu used to configure OSPF for a Virtual Link. See page 380 to view menu options.

md5key *<key ID (1-255)>*

Assigns a string to MD5 authentication key.

host *<1-128>*

Displays the menu for configuring OSPF for the host routes. Up to 128 host routes can be configured. Host routes are used for advertising network device IP addresses to external networks to perform server load balancing within OSPF. It also makes Area Border Route (ABR) load sharing and ABR failover possible. See page 382 to view menu options.

Table 220 OSPF Configuration Options

Command Syntax and Usage

redist fixed|**static**|**rip**|**ebgp**|**ibgp**

Displays the OSPF Route Distribution menu. See page 383 to view menu options.

lsdb *<LSDB limit (0-12288, 0 for no limit)>*

Sets the link state database limit.

default *<metric (1-16777214)>* *<metric-type 1|2>*|**none**

Sets one default route among multiple choices in an area. Use none for no default.

on

Enables OSPF on the G8000.

off

Disables OSPF on the G8000.

cur

Displays the current OSPF configuration settings.

/cfg/l3/ospf/aindex *<area index (0-2)>*
Area Index Configuration

```
[OSPF Area (index) 1 Menu]
      areaid  - Set area ID
      type    - Set area type
      metric  - Set stub area metric
      auth    - Set authentication type
      spf     - Set time interval between two SPF calculations
      enable  - Enable area
      disable - Disable area
      delete  - Delete area
      cur     - Display current OSPF area configuration
```

Table 221   Area Index Configuration Options

Command Syntax and Usage

areaid *<IP address (such as, 192.4.17.101)>*

Defines the IP address of the OSPF area number.

type {transit|stub|nssa}

Defines the type of area. For example, when a virtual link has to be established with the backbone, the area type must be defined as transit.

Transit area: allows area summary information to be exchanged between routing devices. Any area that is not a stub area or NSSA is considered to be transit area.

Stub area: is an area where external routing information is not distributed. Typically, a stub area is connected to only one other area.

NSSA: Not-So-Stubby Area (NSSA) is similar to stub area with additional capabilities. For example, routes originating from within the NSSA can be propagated to adjacent transit and backbone areas. External routes from outside the Autonomous System (AS) can be advertised within the NSSA but are not distributed into other areas.

metric *<metric value (1-65535)>*

Configures a stub area to send a numeric metric value. All routes received via that stub area carry the configured metric to potentially influencing routing decisions.

Metric value assigns the priority for choosing the switch for default route. Metric type determines the method for influencing routing decisions for external routes.

Table 221   Area Index Configuration Options

Command Syntax and Usage

auth {none|password|md5}

- □   none: No authentication required.
- □   password: Authenticates simple passwords so that only trusted routing devices can participate.
- □   md5: This parameter is used when MD5 cryptographic authentication is required.

spf   *<interval (1-255)>*

Configures the minimum time interval, in seconds, between two successive SPF (shortest path first) calculations of the shortest path tree using the Dijkstra's algorithm. The default value is 10 seconds.

enable

Enables the OSPF area.

disable

Disables the OSPF area.

delete

Deletes the OSPF area.

cur

Displays the current OSPF configuration.

/cfg/l3/ospf/range *<range number>*
OSPF Summary Range Configuration

```
[OSPF Summary Range 1 Menu]
      addr   - Set IP address
      mask   - Set IP mask
      aindex - Set area index
      hide   - Enable/disable hide range
      enable - Enable range
      disable - Disable range
      delete - Delete range
      cur    - Display current OSPF summary range configuration
```

Table 222 OSPF Summary Range Configuration Options

Command Syntax and Usage

addr *<IP Address (such as, 192.4.17.101)>*

Configures the base IP address for the range.

mask *<IP mask (such as, 255.255.255.0)>*

Configures the IP address mask for the range.

aindex *<area index>*

Configures the area index used by the G8000.

hide disable|enable

Hides the OSPF summary range.

enable

Enables the OSPF summary range.

disable

Disables the OSPF summary range.

delete

Deletes the OSPF summary range.

cur

Displays the current OSPF summary range.

/cfg/l3/ospf/if *<interface number>*
OSPF Interface Configuration

```
[OSPF Interface 1 Menu]
      aindex  - Set area index
      prio    - Set interface router priority
      cost    - Set interface cost
      hello   - Set hello interval in seconds or milliseconds
      dead    - Set dead interval in seconds or milliseconds
      trans   - Set transit delay in seconds
      retra   - Set retransmit interval in seconds
      key     - Set authentication key
      mdkey   - Set MD5 key ID
      passive - Enable/disable passive interface
      ptop    - Enable/disable point-to-point interface
      enable  - Enable interface
      disable - Disable interface
      delete  - Delete interface
      cur     - Display current OSPF interface configuration
```

Table 223 OSPF Interface Configuration Options

Command Syntax and Usage

aindex *<area index>*

Configures the OSPF area index.

prio *<priority value (0-255)>*

Configures the priority value for the G8000's OSPF interfaces.

(A priority value of 255 is the highest and 1 is the lowest. A priority value of 0 specifies that the interface cannot be used as Designated Router (DR) or Backup Designated Router (BDR).)

cost *<1-65535>*

Configures cost set for the selected path—preferred or backup. Usually the cost is inversely proportional to the bandwidth of the interface. Low cost indicates high bandwidth.

hello *<1-65535>*
hello *<50-65535ms>*

Configures the interval, in seconds or milliseconds, between the hello packets for the interfaces.

Table 223   OSPF Interface Configuration Options

Command Syntax and Usage

dead *<1-65535>*
dead *<1000-65535ms>*

Configures the health parameters of a `hello` packet, in seconds or milliseconds, before declaring a silent router to be down.

trans *<1-3600>*

Configures the transit delay in seconds.

retra *<1-3600>*

Configures the retransmit interval in seconds.

key *<key>*|**none**

Sets the authentication key to clear the password.

mdkey *<key ID (1-255)>*|**none**

Assigns an MD5 key to the interface.

passive enable|disable

Sets the interface as passive. On a passive interface, you can disable OSPF protocol exchanges, but the router advertises the interface in its LSAs so that IP connectivity to the attached network segment will be established.

ptop enable|disable

Sets the interface as point-to-point.

enable

Enables OSPF interface.

disable

Disables OSPF interface.

delete

Deletes OSPF interface.

cur

Displays the current settings for OSPF interface.

/cfg/l3/ospf/virt <link number>
OSPF Virtual Link Configuration

```
[OSPF Virtual Link 1 Menu]
      aindex  - Set area index
      hello   - Set hello interval in seconds or milliseconds
      dead    - Set dead interval in seconds or milliseconds
      trans   - Set transit delay in seconds
      retra   - Set retransmit interval in seconds
      nbr     - Set router ID of virtual neighbor
      key     - Set authentication key
      mdkey   - Set MD5 key ID
      enable  - Enable interface
      disable - Disable interface
      delete  - Delete interface
      cur     - Display current OSPF interface configuration
```

Table 224 OSPF Virtual Link Configuration Options

Command Syntax and Usage

aindex *<area index>*

Configures the OSPF area index.

hello *<1-65535>*
hello *<50-65535ms>*

Configures the authentication parameters of a hello packet, in seconds or milliseconds. The default value is 10 seconds.

dead *<1-65535>*
dead *<1000-65535ms>*

Configures the health parameters of a hello packet, in seconds or milliseconds. The default value is 60 seconds.

trans *<1-3600>*

Configures the delay in transit, in seconds. The default value is one second.

retra *<1-3600>*

Configures the retransmit interval, in seconds. The default value is five seconds.

nbr *<NBR router ID (IP address)>*

Configures the router ID of the virtual neighbor. The default value is 0.0.0.0.

Table 224 OSPF Virtual Link Configuration Options

Command Syntax and Usage

key *<password>***|none**

Configures the password (up to eight characters) for each virtual link. The default setting is none.

mdkey *<key ID (1-255)>*|**none**

Sets MD5 key ID for each virtual link. The default setting is none.

enable

Enables OSPF virtual link.

disable

Disables OSPF virtual link.

delete

Deletes OSPF virtual link.

cur

Displays the current OSPF virtual link settings.

/cfg/l3/ospf/host *<host number>*
OSPF Host Entry Configuration

```
[OSPF Host Entry 1 Menu]
     addr   - Set host entry IP address
     aindex - Set area index
     cost   - Set cost of this host entry
     enable - Enable host entry
     disable - Disable host entry
     delete - Delete host entry
     cur    - Display current OSPF host entry configuration
```

Table 225 OSPF Host Entry Configuration Options

Command Syntax and Usage

addr *<IP address (such as, 192.4.17.101)>*

Configures the base IP address for the host entry.

aindex *<area index>*

Configures the area index of the host.

cost *<1-65535>*

Configures the cost value of the host.

enable

Enables OSPF host entry.

disable

Disables OSPF host entry.

delete

Deletes OSPF host entry.

cur

Displays the current OSPF host entries.

`/cfg/l3/ospf/redist fixed|static|rip|ebgp|ibgp`
OSPF Route Redistribution Configuration

```
[OSPF Redistribute Fixed Menu]
      add     - Add rmap into route redistribution list
      rem     - Remove rmap from route redistribution list
      export  - Export all routes of this protocol
      cur     - Display current route-maps added
```

Table 226 OSPF Route Redistribution Options

Command Syntax and Usage

add *(<route map (1-32)> <route map (1-32)>... |* **all**

Adds selected routing maps to the rmap list. To add all the 32 route maps, enter `all`. To add specific route maps, enter routing map numbers one per line, NULL at the end.

This option adds a route map to the route redistribution list. The routes of the redistribution protocol matched by the route maps in the route redistribution list will be redistributed.

rem *(<route map (1-32)> <route map (1-32)> ... |* **all**

Removes the route map from the route redistribution list.

Removes routing maps from the `rmap` list. To remove all 32 route maps, enter `all`. To remove specific route maps, enter routing map numbers one per line, NULL at end.

export *<metric (1-16777214)> <metric type (1-2)> |* **none**

Exports the routes of this protocol as external OSPF AS-external LSAs in which the metric and metric type are specified. To remove a previous configuration and stop exporting the routes of the protocol, enter `none`.

cur

Displays the current route map settings.

/cfg/l3/ospf/md5key *<key ID>*
OSPF MD5 Key Configuration

```
[OSPF MD5 Key 1 Menu]
      key     - Set authentication key
      delete  - Delete key
      cur     - Display current MD5 key configuration
```

Table 227 OSPF MD5 Key Configuration Options

Command Syntax and Usage

key *<1-16 characters>*

Sets the authentication key for this OSPF packet.

delete

Deletes the authentication key for this OSPF packet.

cur

Displays the current MD5 key configuration.

`/cfg/l3/bgp`
Border Gateway Protocol Configuration

```
[Border Gateway Protocol Menu]
     peer    - Peer menu
     aggr    - Aggregation menu
     as      - Set Autonomous System (AS) number
     pref    - Set Local Preference
     on      - Globally turn BGP ON
     off     - Globally turn BGP OFF
     cur     - Display current BGP configuration
```

Border Gateway Protocol (BGP) is an Internet protocol that enables routers on a network to share routing information with each other and advertise information about the segments of the IP address space they can access within their network with routers on external networks. BGP allows you to decide what is the "best" route for a packet to take from your network to a destination on another network, rather than simply setting a default route from your border router(s) to your upstream provider(s). You can configure BGP either within an autonomous system or between different autonomous systems. When run within an autonomous system, it's called internal BGP (iBGP). When run between different autonomous systems, it's called external BGP (eBGP). BGP is defined in RFC 1771.

BGP commands enable you to configure the switch to receive routes and to advertise static routes, fixed routes and virtual server IP addresses with other internal and external routers. In the current BLADEOS implementation, the G8000 does not advertise BGP routes that are learned from one iBGP *speaker* to another iBGP *speaker*.

BGP is turned off by default.

Note – Fixed routes are subnet routes. There is one fixed route per IP interface.

Table 228   Border Gateway Protocol Options

Command Syntax and Usage

peer   *<peer number (1-16)>*

Displays the menu used to configure each BGP *peer.* Each border router, within an autonomous system, exchanges routing information with routers on other external networks. To view menu options, see page 387.

aggr   *<aggregate number (1-16)>*

Displays the BGP Aggregation menu. To view menu options, see page 391.

Table 228   Border Gateway Protocol Options

Command Syntax and Usage

as *<0-65535>*

Set Autonomous System number.

pref *<local preference (0-4294967294)>*

Sets the local preference. The path with the higher value is preferred.

When multiple peers advertise the same route, use the route with the shortest AS path as the preferred route if you are using eBGP, or use the local preference if you are using iBGP.

on

Globally turns BGP on.

off

Globally turns BGP off.

cur

Displays the current BGP configuration.

/cfg/l3/bgp/peer *<peer number>*
BGP Peer Configuration

```
[BGP Peer 1 Menu]
     redist  - Redistribution menu
     addr    - Set remote IP address
     ras     - Set remote autonomous system number
     hold    - Set hold time
     alive   - Set keep alive time
     advert  - Set min time between advertisements
     retry   - Set connect retry interval
     orig    - Set min time between route originations
     ttl     - Set time-to-live of IP datagrams
     addi    - Add rmap into in-rmap list
     addo    - Add rmap into out-rmap list
     remi    - Remove rmap from in-rmap list
     remo    - Remove rmap from out-rmap list
     enable - Enable peer
     disable - Disable peer
     delete  - Delete peer
     passwd  - Set password
     cur     - Display current peer configuration
```

This menu is used to configure BGP peers, which are border routers that exchange routing information with routers on internal and external networks. The peer option is disabled by default.

Table 229   BGP Peer Configuration Options

Command Syntax and Usage

redist

Displays BGP Redistribution menu. To view the menu options, see page 389.

addr *<IP address (such as 192.4.17.101)>*

Defines the IP address for the specified peer (border router), using dotted decimal notation. The default address is 0.0.0.0.

ras *<AS number (0-65535)>*

Sets the remote autonomous system number for the specified peer.

hold *<hold time (0, 3-65535)>*

Sets the period of time, in seconds, that will elapse before the peer session is torn down because the switch hasn't received a "keep alive" message from the peer. The default value is 180.

Table 229   BGP Peer Configuration Options (continued)

Command Syntax and Usage

alive   *<keepalive time (0, 1-21845)>*

Sets the keep-alive time for the specified peer in seconds. The default value is 60.

advert   *<min adv time (1-65535)>*

Sets time, in seconds, between advertisements. The default value is 60 seconds.

retry   *<connect retry interval (1-65535)>*

Sets connection retry interval, in seconds. The default value is 120 seconds.

orig   *<min orig time (1-65535)>*

Sets the minimum time between route originations, in seconds. The default value is 15 seconds.

ttl   *<number of router hops (1-255)>*

Time-to-live (TTL) is a value in an IP packet that tells a network router whether or not the packet has been in the network too long and should be discarded. TTL specifies a certain time span in seconds that, when exhausted, would cause the packet to be discarded. The TTL is determined by the number of router hops the packet is allowed before it must be discarded.

This command specifies the number of router hops that the IP packet can make. This value is used to restrict the number of "hops" the advertisement makes. It is also used to support multi-hops, which allow BGP peers to talk across a routed network. The default number is set at 1.

Note: The TTL value is significant only to eBGP peers, for iBGP peers the TTL value in the IP packets is always 255 (regardless of the configured value).

addi   *<route map ID (1-32)>*

Adds route map into in-route map list.

addo   *<route map ID (1-32)>*

Adds route map into out-route map list.

remi   *<route map ID (1-32)>*

Removes route map from in-route map list.

remo   *<route map ID (1-32)>*

Removes route map from out-route map list.

Table 229 BGP Peer Configuration Options (continued)

Command Syntax and Usage

enable

Enables this peer configuration.

disable

Disables this peer configuration.

delete

Deletes this peer configuration.

passwd *<1-16 characters>***|none**

Configures the BGP peer password.

cur

Displays the current BGP peer configuration.

/cfg/l3/bgp/peer/redist
BGP Redistribution Configuration

```
[Redistribution Menu]
      metric  - Set default-metric of advertised routes
      default - Set default route action
      rip     - Enable/disable advertising RIP routes
      ospf    - Enable/disable advertising OSPF routes
      fixed   - Enable/disable advertising fixed routes
      static  - Enable/disable advertising static routes
      cur     - Display current redistribution configuration
```

Table 230 BGP Redistribution Options

Command Syntax and Usage

metric *<metric (1-4294967294)>*|**none**

Sets default metric of advertised routes.

default none|**import**|**originate**|**redistribute**

Sets default route action. Default routes can be configured as follows:

- □ none: No routes are configured
- □ import: Import these routes.
- □ originate: The switch sends a default route to peers if it does not have any default routes in its routing table.
- □ redistribute: Default routes are either configured through default gateway or learned through other protocols and redistributed to peer. If the routes are learned from default gateway configuration, you have to enable static routes since the routes from default gateway are static routes. Similarly, if the routes are learned from a certain routing protocol, you have to enable that protocol in this redistribute submenu.

rip disable|**enable**

Enables or disables advertising RIP routes

ospf disable|**enable**

Enables or disables advertising OSPF routes.

fixed disable|**enable**

Enables or disables advertising fixed routes.

static disable|**enable**

Enables or disables advertising static routes.

cur

Displays current redistribution configuration.

`/cfg/l3/bgp/aggr` *<aggregation number>*
BGP Aggregation Configuration

```
[BGP Aggr 1 Menu]
      addr   - Set aggregation IP address
      mask   - Set aggregation network mask
      enable - Enable aggregation
      disable - Disable aggregation
      delete - Delete aggregation
      cur    - Display current aggregation configuration
```

This menu enables you to configure BGP aggregation to specify the routes/range of IP destinations a peer router accepts from other peers. All matched routes are aggregated to one route, to reduce the size of the routing table. By default, the first aggregation number is enabled and the rest are disabled.

Table 231   BGP Aggregation Configuration Options

Command Syntax and Usage

addr *<IP address (such as 192.4.17.101)>*

Defines the starting subnet IP address for this aggregation, using dotted decimal notation. The default address is 0.0.0.0.

mask *<IP subnet mask (such as, 255.255.255.0)>*

This IP address mask is used with `addr` to define the range of IP addresses that will be accepted by the peer when the aggregation is enabled. The default address is 0.0.0.0.

ena

Enables this BGP aggregation.

dis

Disables this BGP aggregation.

del

Deletes this BGP aggregation.

cur

Displays the current BGP aggregation configuration.

`/cfg/l3/igmp`
IGMP Configuration

```
[IGMP Menu]
     snoop    - IGMP Snoop Menu
     relay    - IGMP Relay Menu
     mrouter  - Static Multicast Router Menu
     igmpflt  - IGMP Filtering Menu
     adv      - IGMP Advanced Menu
     on       - Globally turn IGMP ON
     off      - Globally turn IGMP OFF
     cur      - Display current IGMP configuration
```

Table 232 describes the commands used to configure basic IGMP parameters.

Table 232 IGMP Configuration Options

Command Syntax and Usage

snoop

Displays the IGMP Snooping menu. To view menu options, see page 393.

relay

Displays the IGMP Relay menu. To view menu options, see page 396.

mrouter

Displays the Static Multicast Router menu. To view menu options, see page 398.

igmpflt

Displays the IGMP Filtering menu. To view menu options, see page 399.

adv

Displays the IGMP Advanced menu. To view menu options, see page 402.

on

Globally turns IGMP on.

off

Globally turns IGMP off.

cur

Displays the current IGMP configuration parameters.

/cfg/l3/igmp/snoop
IGMP Snooping Configuration

```
[IGMP Snoop Menu]
      igmpv3  - IGMP Version3 Snoop Menu
      mrto    - Set multicast router timeout
      aggr    - Aggregate IGMP report
      srcip   - Set source ip to use when proxying GSQ
      add     - Add VLAN(s) to IGMP Snooping
      rem     - Remove VLAN(s) from IGMP Snooping
      clear   - Remove all VLAN(s) from IGMP Snooping
      ena     - Enable IGMP Snooping
      dis     - Disable IGMP Snooping
      def     - Set IGMP Snooping settings to factory default
      cur     - Display current IGMP Snooping configuration
```

IGMP Snooping allows the switch to forward multicast traffic only to those ports that request it. IGMP Snooping prevents multicast traffic from being flooded to all ports. The switch learns which server hosts are interested in receiving multicast traffic, and forwards it only to ports connected to those servers.

Table 233 describes the commands used to configure IGMP Snooping.

Table 233   IGMP Snoop Options

Command Syntax and Usage

igmpv3

Displays the IGMP version 3 menu. To view menu options, see page 394.

mrto *<1-600 seconds>*

Configures the timeout value for IGMP Membership Queries (mrouter). Once the timeout value is reached, the switch removes the multicast router from its IGMP table, if the proper conditions are met. The range is from 1 to 600 seconds. The default is 255 seconds.

aggr enable|**disable**

Enables or disables IGMP Membership Report aggregation.

srcip *<IP address (such as, 192.4.17.101)>*

Configures the source IP address used as a proxy for IGMP Group Specific Queries.

add *<VLAN number>*

Adds the selected VLAN(s) to IGMP Snooping.

Table 233   IGMP Snoop Options

Command Syntax and Usage

rem *<VLAN number>*

Removes the selected VLAN(s) from IGMP Snooping.

clear

Removes all VLANs from IGMP Snooping.

ena

Enables IGMP Snooping.

dis

Disables IGMP Snooping.

def

Resets IGMP Snooping parameters to their default values.

cur

Displays the current IGMP Snooping parameters.

/cfg/l3/igmp/snoop/igmpv3
IGMP Version 3 Configuration

```
[IGMP V3 Snoop Menu]
     sources  - Set the number of sources to snoop in group record
     v1v2     - Enable/disable snooping IGMPv1/v2 reports
     exclude  - Enable/disable snooping EXCLUDE mode reports
     ena      - Enable IGMPv3 Snooping
     dis      - Disable IGMPv3 Snooping
     cur      - Display current IGMP Snooping V3 configuration
```

Table 234 describes the commands used to configure IGMP version 3.

Table 234   IGMP V3 Options

Command Syntax and Usage

sources *<1-64>*

Configures the maximum number of IGMP multicast sources to snoop from within the group record. Use this command to limit the number of IGMP sources to provide more refined control. The default value is 8.

v1v2 enable|disable

 Enables or disables snooping on IGMP version 1 and version 2 reports. When disabled, the switch drops IGMPv1 and IGMPv2 reports. The default value is enabled.

exclude enable|disable

Enables or disables snooping on IGMPv3 Exclude Reports. When disabled, the switch ignores Exclude Reports. The default value is enabled.

ena

Enables IGMP version 3. The default value is **disabled**.

dis

Disables IGMP version 3.

cur

Displays the current IGMP version 3 configuration.

/cfg/l3/igmp/relay
IGMP Relay Configuration

```
[IGMP Relay Menu]
     mrtr     - Upstream Multicast Router Menu
     add      - Add VLAN(s) to downstream
     rem      - Remove VLAN(s) from downstream
     clear    - Remove all VLAN(s) from downstream
     report   - Set unsolicited report interval
     ena      - Enable IGMP Relay
     dis      - Disable IGMP Relay
     cur      - Display current IGMP Relay configuration
```

Table 236 describes the commands used to configure IGMP Relay.

Table 235   IGMP Relay Options

Command Syntax and Usage

mrtr *<multicast router number (1-2)>*

Displays the Upstream Multicast Router menu. To view menu options, see page 397.

add *<VLAN number>*

Adds the VLAN to the list of IGMP Relay VLANs.

rem *<VLAN number>*

Removes the VLAN from the list of IGMP Relay VLANs.

clear

Removes all VLANs from the list of IGMP Relay VLANs.

report *<10-150>*

Configures the interval between unsolicited Join reports sent by the switch, in seconds.

The default value is 10.

ena

Enables IGMP Relay.

dis

Disables IGMP Relay.

cur

Displays the current IGMP Relay configuration.

/cfg/l3/igmp/relay/mrtr *<Mrouter number>*
IGMP Relay Multicast Router Configuration

```
[Multicast router 2 Menu]
    addr    - Set IP address of multicast router
    intr    - Set interval between ping attempts
    retry   - Set number of failed attempts to declare router DOWN
    restr   - Set number of successful attempts to declare router UP
    version - Set IGMP version
    ena     - Enable multicast router
    dis     - Disable multicast router
    del     - Delete multicast router
    cur     - Display current multicast router configuration
```

Table 238 describes the commands used to configure the IGMP Relay multicast router.

Table 236   IGMP Relay Mrouter Options

Command Syntax and Usage

addr *<IP address (such as, 224.0.1.0)>*

Configures the IP address of the IGMP multicast router used for IGMP Relay.

intr *<1-60>*

Configures the time interval between ping attempts to the upstream Mrouters, in seconds.

The default value is 2.

retry *<1-120>*

Configures the number of failed ping attempts required before the switch declares this Mrouter is down. The default value is 4.

restr *<1-128>*

Configures the number of successful ping attempts required before the switch declares this Mrouter is up. The default value is 5.

version *<1-2>*

Configures the IGMP version (1 or 2) of the multicast router.

ena

Enables the multicast router.

dis

Disables the multicast router.

Table 236 IGMP Relay Mrouter Options

Command Syntax and Usage

del

Deletes the multicast router from IGMP Relay.

cur

Displays the current IGMP Relay multicast router parameters.

/cfg/l3/igmp/mrouter
IGMP Static Multicast Router Configuration

```
[Static Multicast Router Menu]
      add    - Add port as Multicast Router Port
      rem    - Remove port as Multicast Router Port
      clear  - Remove all Static Multicast Router Ports
      cur    - Display current Multicast Router configuration
```

Table 237 describes the commands used to configure a static multicast router.

Note – When static Mrouters are used, the switch continues learning dynamic Mrouters via IGMP snooping. However, dynamic Mrouters may not replace static Mrouters. If a dynamic Mrouter has the same port and VLAN combination as a static Mrouter, the dynamic Mrouter is not learned.

Table 237 IGMP Static Multicast Router Options

Command Syntax and Usage

add *<port number> <VLAN number> <IGMP version number>*

Selects a port/VLAN combination on which the static multicast router is connected, and configures the IGMP version (1, 2, or 3) of the multicast router.

rem *<port number> <VLAN number> <IGMP version number>*

Removes a static multicast router from the selected port/VLAN combination.

clear

Clears all static multicast routers from the switch.

cur

Displays the current IGMP Static Multicast Router parameters.

/cfg/l3/igmp/igmpflt
IGMP Filtering Configuration

```
[IGMP Filter Menu]
      filter  - IGMP Filter Definition Menu
      port    - IGMP Filtering Port Menu
      ena     - Enable IGMP Filtering
      dis     - Disable IGMP Filtering
      cur     - Display current IGMP Filtering configuration
```

Table 238 describes the commands used to configure an IGMP filter.

Table 238 IGMP Filtering Options

Command Syntax and Usage

filter *<filter number (1-16)>*

Displays the IGMP Filter Definition menu. To view menu options, see page 400.

port *<port alias or number>*

Displays the IGMP Filtering Port menu. To view menu options, see page 401.

ena

Enables IGMP filtering globally.

dis

Disables IGMP filtering globally.

cur

Displays the current IGMP Filtering parameters.

/cfg/l3/igmp/igmpflt/filter *<filter number>*
IGMP Filter Definition

```
[IGMP Filter 1 Definition Menu]
      range   - Set IP Multicast address range
      action  - Set filter action
      ena     - Enable filter
      dis     - Disable filter
      del     - Delete filter
      cur     - Display current IGMP filter configuration
```

Table 239 describes the commands used to define an IGMP filter.

Table 239   IGMP Filter Definition Options

Command Syntax and Usage

range *<IP multicast address (such as 225.0.0.10)>* *<IP multicast address>*

Configures the range of IP multicast addresses for this filter.

action allow|**deny**

Allows or denies multicast traffic for the IP multicast addresses specified. The default action is deny.

ena

Enables this IGMP filter.

dis

Disables this IGMP filter.

del

Deletes this filter's parameter definitions.

cur

Displays the current IGMP filter.

/cfg/l3/igmp/igmpflt/port *<port number>*
IGMP Filtering Port Configuration

```
[IGMP Port 1 Menu]
      filt    - Enable/disable IGMP filtering on port
      add     - Add IGMP filter to port
      rem     - Remove IGMP filter from port
      cur     - Display current IGMP filtering Port configuration
```

Table 240 describes the commands used to configure a port for IGMP filtering.

Table 240   IGMP Filter Port Options

Command Syntax and Usage

filt enable|**disable**

Enables or disables IGMP filtering on this port.

add *<filter number (1-16)>*

Adds an IGMP filter to this port.

rem *<filter number (1-16)>*

Removes an IGMP filter from this port.

cur

Displays the current IGMP filter parameters for this port.

/cfg/l3/igmp/adv
IGMP Advanced Configuration

```
[IGMP Advanced Menu]
     qintrval - Set IGMP query interval
     robust   - Set expected packet loss on subnet
     timeout  - Set report timeout
     fastlv   - Enable/disable Fastleave processing in VLAN
     flood    - Flood unregistered IPMC
     cpu      - Send unregistered IPMC to CPU
     rtralert - Send IGMP messages with Router Alert option
     cur      - Display current IGMP Advanced configuration
```

Table 238 describes the commands used to configure advanced IGMP parameters.

Table 241   IGMP Advanced Options

Command Syntax and Usage

qinterval *<1-600>*

Configures the interval for IGMP Query Reports. The default value is 125 seconds.

robust *<2-10>*

Configures the IGMP Robustness variable, which allows you to tune the switch for expected packet loss on the subnet. If the subnet is expected to be lossy (high rate of packet loss), increase the value. The default value is 2.

timeout *<1-255>*

Configures the timeout value for IGMP Membership Reports (host). Once the timeout value is reached, the switch removes the host from its IGMP table, if the conditions are met. The range is from 1 to 255 seconds. The default is 10 seconds.

fastlv *<VLAN number>* **disable|enable**

Enables or disables Fastleave processing. Fastleave allows the switch to immediately remove a port from the IGMP port list, if the host sends a Leave message, and the proper conditions are met. This command is disabled by default.

flood enable|disable

Configures the switch to flood unregistered IP multicast traffic to all ports. The default setting is enabled.

Note: If none of the IGMP hosts reside on the VLAN of the streaming server for a IPMC group, you must disable IGMP flooding to ensure that multicast data is forwarded across the VLANs for that IPMC group.

Table 241   IGMP Advanced Options

Command Syntax and Usage

`cpu enable`|`disable`

Configures the switch to forward unregistered IP multicast traffic to the MP, which adds an entry in the IPMC table, as follows:

☐   If no Mrouter is present, drop subsequent packets with same IPMC.

☐   If an Mrouter is present, forward subsequent packets to the Mrouter(s) on the ingress VLAN.

The default setting is `enabled`.

Note: If both **`flood`** and **`cpu`** are disabled, then the switch drops all unregistered IPMC traffic.

`retralert ena|dis`

 Enables or disables the Router Alert option in IGMP messages.

`cur`

Displays the current IGMP Advanced parameters.

/cfg/l3/dns
Domain Name System Configuration

```
[Domain Name System Menu]
     prima    - Set IP address of primary DNS server
     secon    - Set IP address of secondary DNS server
     reqver   - Set the IP version of DNS record to request first
     dname    - Set default domain name
     cur      - Display current DNS configuration
```

The Domain Name System (DNS) menu is used for defining the primary and secondary DNS servers on your local network, and for setting the default domain name served by the switch services. DNS parameters must be configured prior to using hostname parameters with the ping, traceroute, and tftp commands.

Table 242 Domain Name Service Options

Command Syntax and Usage

prima *<IPv4 or IPv6 address>*

Sets the IPv4 or IPv6 address for your primary DNS server.

secon *<IPv4 or IPv6 address)>*

Sets the IPv4 or IPv6 address for your secondary DNS server. If the primary DNS server fails, the configured secondary is used instead.

reqver v4|v6

Configures the protocol used for the first request to the DNS server, as follows:

   □ **v4**: IPv4
   □ **v6**: IPv6

dname *<dotted DNS notation>*|**none**

Sets the default domain name used by the switch. For example: mycompany.com

cur

Displays the current Domain Name System settings.

`/cfg/l3/bootp`
Bootstrap Protocol Relay Configuration

```
[Bootstrap Protocol Relay Menu]
     server   - Set BOOTP server properties
     bdomain  - Broadcast domain menu
     on       - Globally turn BOOTP relay ON
     off      - Globally turn BOOTP relay OFF
     cur      - Display current BOOTP relay configuration
```

The Bootstrap Protocol (BOOTP) Relay menu is used to allow hosts to obtain their configurations from a Dynamic Host Configuration Protocol (DHCP) server. The BOOTP configuration enables the switch to forward a client request for an IP address to two DHCP/BOOTP servers with IP addresses that have been configured on the G8000.

BOOTP relay is turned off by default. BOOTP relay is turned off by default.

Table 243   Global BOOTP Relay Configuration Options

Command Syntax and Usage

server *<1-4>*

Displays the BOOTP Server menu, which allows you to configure an IP address for up to 4 global BOOTP servers. To view menu options, see page 406.

bdomain *<1-10>*

Displays the BOOTP Broadcast Domain menu, which allows you to configure BOOTP servers for a specific broadcast domain. To view menu options, see page 406.

on

Globally turns on BOOTP relay.

off

Globally turns off BOOTP relay.

cur

Displays the current BOOTP relay configuration.

`/cfg/l3/bootp/server` *<1-4>*
BOOTP Relay Server Configuration

```
[BOOTP Server 2 Menu]
     address  - Set BOOTP server address
     delete   - Delete BOOTP server
```

This menu allows you to configure an IP address for a global BOOTP server.

Table 244   BOOTP Relay Server Configuration Options

Command Syntax and Usage

address *<IPv4 address>*

Sets the IP address of the BOOTP server.

delete

Deletes the selected BOOTP server configuration.

`/cfg/l3/bootp/bdomain` *<1-10>*
BootP Relay Broadcast Domain Configuration

```
[Broadcast Domain 2 Menu]
     vlan     - VLAN number
     server   - Set IP address of BOOTP server
     enable   - Enable broadcast domain
     disable  - Disable broadcast domain
     delete   - Delete broadcast domain
     cur      - Display current broadcast domain configuration
```

This menu allows you to configure a BOOTP server for a specific broadcast domain, based on its associated VLAN.

Table 245   BOOTP Relay Broadcast Domain Configuration Options

Command Syntax and Usage

vlan *<VLAN number>*

Configures the VLAN of the broadcast domain. Each broadcast domain must have a unique VLAN.

server *<1-4>*

Displays the BOOTP Server menu, which allows you to configure an IP address for the BOOTP server. To view menu options, see .

Table 245   BOOTP Relay Broadcast Domain Configuration Options

Command Syntax and Usage

enable

Enables BOOTP Relay for the broadcast domain.

disable

Disables BOOTP Relay for the broadcast domain. When disabled, BOOTP Relay is performed by one of the global BOOTP servers.

delete

Deletes the selected broadcast domain configuration.

cur

Displays the current parameters for the BOOTP Relay Broadcast Domain.

`/cfg/l3/vrrp`
VRRP Configuration

```
[Virtual Router Redundancy Protocol Menu]
     vr      - VRRP Virtual Router menu
     group   - VRRP Virtual Router Group menu
     if      - VRRP Interface menu
     track   - VRRP Priority Tracking menu
     on      - Globally turn VRRP ON
     off     - Globally turn VRRP OFF
     cur     - Display current VRRP configuration
```

Virtual Router Redundancy Protocol (VRRP) support on the G8000 provides redundancy between routers in a LAN. This is accomplished by configuring the same virtual router IP address and ID number on each participating VRRP-capable routing device. One of the virtual routers is then elected as the master, based on a number of priority criteria, and assumes control of the shared virtual router IP address. If the master fails, one of the backup virtual routers will assume routing authority and take control of the virtual router IP address.

By default, VRRP is disabled. BLADEOS has extended VRRP to include virtual servers as well, allowing for full active/active redundancy between switches. For more information on VRRP, see the "High Availability" chapter in the *Application Guide*.

Table 246   VRRP Configuration Options

Command Syntax and Usage

`vr`   *<virtual router number (1-255)>*

Displays the VRRP Virtual Router menu. This menu is used for configuring virtual routers on this switch. To view menu options, see page 410.

`group`

Displays the VRRP Virtual Router Group menu, used to combine all virtual routers together as one logical entity. To view menu options, see page 414.

`if`   *<interface number>*

Displays the VRRP Virtual Router Interface menu. To view menu options, see page 418.

`track`

Displays the VRRP Tracking menu. This menu is used for weighting the criteria used when modifying priority levels in the master router election process. To view menu options, see page 419.

Table 246 VRRP Configuration Options

Command Syntax and Usage

on

 Globally enables VRRP on this switch.

off

 Globally disables VRRP on this switch.

cur

 Displays the current VRRP parameters.

`/cfg/l3/vrrp/vr` *<router number>*
Virtual Router Configuration

```
[VRRP Virtual Router 1 Menu]
     track   - Priority Tracking Menu
     vrid    - Set virtual router ID
     addr    - Set IP address
     if      - Set interface number
     prio    - Set router priority
     adver   - Set advertisement interval
     predelay - Set preempt-delay interval
     preem   - Enable or disable preemption
     fadver  - Enable/disable fast advertisement
     ena     - Enable virtual router
     dis     - Disable virtual router
     del     - Delete virtual router
     cur     - Display current VRRP virtual router configuration
```

This menu is used for configuring virtual routers for this switch. A virtual router is defined by its virtual router ID and an IP address. On each VRRP-capable routing device participating in redundancy for this virtual router, a virtual router will be configured to share the same virtual router ID and IP address.

Virtual routers are disabled by default.

Table 247   VRRP Virtual Router Options

Command Syntax and Usage

track

> Displays the VRRP Priority Tracking menu for this virtual router. Tracking is a BLADEOS proprietary extension to VRRP, used for modifying the standard priority system used for electing the master router. To view menu options, see page 413.

vrid *<virtual router ID (1-255)>*

> Defines the virtual router ID. This is used in conjunction with addr (below) to define a virtual router on this switch. To create a pool of VRRP-enabled routing devices which can provide redundancy to each other, each participating VRRP device must be configured with the same virtual router: one that shares the same vrid and addr combination.

> The vrid for standard virtual routers (where the virtual router IP address is not the same as any virtual server) can be any integer between 1 and 255. The default value is 1.

> All vrid values must be unique within the VLAN to which the virtual router's IP interface belongs.

Table 247 VRRP Virtual Router Options

Command Syntax and Usage

addr *<IP address (such as, 192.4.17.101)>*

Defines the IP address for this virtual router using dotted decimal notation. This is used in conjunction with the vrid (above) to configure the same virtual router on each participating VRRP device. The default address is 0.0.0.0.

if *<interface number>*

Selects a switch IP interface. If the IP interface has the same IP address as the addr option above, this switch is considered the "owner" of the defined virtual router. An owner has a special priority of 255 (highest) and will always assume the role of master router, even if it must pre-empt another virtual router which has assumed master routing authority. This pre-emption occurs even if the preem option below is disabled. The default interface is 1.

prio *<1-254>*

Defines the election priority bias for this virtual server. This can be any integer between 1 and 254. The default value is 100.

During the master router election process, the routing device with the highest virtual router priority number wins. If there is a tie, the device with the highest IP interface address wins. If this virtual router's IP address (addr) is the same as the one used by the IP interface, the priority for this virtual router will automatically be set to 255 (highest).

When priority tracking is used (/cfg/l3/vrrp/track or /cfg/l3/vrrp/vr #/track), this base priority value can be modified according to a number of performance and operational criteria.

adver *<1-255>*

Defines the time interval between VRRP master advertisements. This can be any integer between 1 and 255 seconds. The default value is 1.

predelay *<1-255>*

Configures the preempt delay interval. This timer is configured on the VRRP Owner and prevents the switch from transitioning back to Master state until the preempt delay interval has expired. Ensure that the interval is long enough for OSPF or other routing protocols to converge.

Table 247   VRRP Virtual Router Options

Command Syntax and Usage

preem disable|enable

Enables or disables master preemption. When enabled, if this virtual router is in backup mode but has a higher priority than the current master, this virtual router will preempt the lower priority master and assume control. Note that even when preem is disabled, this virtual router will always preempt any other master if this switch is the owner (the IP interface address and virtual router addr are the same). By default, this option is enabled.

fadver e|d

Enables or disables Fast Advertisements. When enabled, the VRRP master advertisements interval is calculated in units of centi-seconds, instead of seconds. For example, if **adver** is set to 1 and **fadver** is enabled, master advertisements are sent every .01 second.

When you disable fast advertisement, the advertisement interval is set to the default value of 1 second. To support Fast Advertisements, set the interval between 20-100 centi-seconds.

ena

Enables this virtual router.

dis

Disables this virtual router.

del

Deletes this virtual router from the switch configuration.

cur

Displays the current configuration information for this virtual router.

`/cfg/l3/vrrp/vr` *<router number>*`/track`
Virtual Router Priority Tracking Configuration

```
[VRRP Virtual Router 1 Priority Tracking Menu]
     vrs     - Enable/disable tracking master virtual routers
     ifs     - Enable/disable tracking other interfaces
     ports   - Enable/disable tracking VLAN switch ports
     cur     - Display current VRRP virtual router configuration
```

This menu is used for modifying the priority system used when electing the master router from a pool of virtual routers. Various tracking criteria can be used to bias the election results. Each time one of the tracking criteria is met, the priority level for the virtual router is increased by an amount defined through the VRRP Tracking menu (see page 419).

Criteria are tracked dynamically, continuously updating virtual router priority levels when enabled. If the virtual router pre-emption option (see preem in Table 247 on page 410) is enabled, this virtual router can assume master routing authority when its priority level rises above that of the current master.

Some tracking criteria (vrs, ifs, and ports below) apply to standard virtual routers, otherwise called "virtual interface routers." A virtual *server* router is defined as any virtual router whose IP address (addr) is the same as any configured virtual server IP address.

Table 248   Virtual Router Priority Tracking Options

Command Syntax and Usage

`vrs disable`|`enable`

When enabled, the priority for this virtual router will be increased for each virtual router in master mode on this switch. This is useful for making sure that traffic for any particular client/server pairing are handled by the same switch, increasing routing and load balancing efficiency. This command is disabled by default.

`ifs disable`|`enable`

When enabled, the priority for this virtual router will be increased for each other IP interface active on this switch. An IP interface is considered active when there is at least one active port on the same VLAN. This helps elect the virtual routers with the most available routes as the master. This command is disabled by default.

Table 248   Virtual Router Priority Tracking Options (continued)

Command Syntax and Usage

`ports disable|enable`

When enabled, the priority for this virtual router will be increased for each active port on the same VLAN. A port is considered "active" if it has a link and is forwarding traffic. This helps elect the virtual routers with the most available ports as the master. This command is disabled by default.

`cur`

Displays the current configuration for priority tracking for this virtual router.

/cfg/l3/vrrp/group
Virtual Router Group Configuration

```
[VRRP Virtual Router Group Menu]
     track   - Priority Tracking Menu
     vrid    - Set virtual router ID
     if      - Set interface number
     prio    - Set renter priority
     adver   - Set advertisement interval
     preem   - Enable or disable preemption
     fadver  - Enable/disable fast advertisement
     ena     - Enable virtual router
     dis     - Disable virtual router
     del     - Delete virtual router
     cur     - Display current VRRP virtual router configuration
```

The Virtual Router Group menu is used for associating all virtual routers into a single logical virtual router, which forces all virtual routers on the G8000 to either be master or backup as a group. A virtual router is defined by its virtual router ID and an IP address. On each VRRP-capable routing device participating in redundancy for this virtual router, a virtual router will be configured to share the same virtual router ID and IP address.

Table 249 Virtual Router Group Options

Command Syntax and Usage

track

> Displays the VRRP Priority Tracking menu for the virtual router group. Tracking is a BLADEOS proprietary extension to VRRP, used for modifying the standard priority system used for electing the master router. To view menu options, see .

vrid *<virtual router ID (1-255)>*

> Defines the virtual router ID.

> The `vrid` for standard virtual routers (where the virtual router IP address is not the same as any virtual server) can be any integer between 1 and 255. All `vrid` values must be unique within the VLAN to which the virtual router's IP interface (see `if` below) belongs. The default virtual router ID is 1.

if *<interface number>*

> Selects a switch IP interface. The default switch IP interface number is 1.

prio *<1-254>*

> Defines the election priority bias for this virtual router group. This can be any integer between 1 and 254. The default value is 100.

> During the master router election process, the routing device with the highest virtual router priority number wins. If there is a tie, the device with the highest IP interface address wins. If this virtual router's IP address (`addr`) is the same as the one used by the IP interface, the priority for this virtual router will automatically be set to 255 (highest).

> When priority tracking is used (`/cfg/l3/vrrp/track` or `/cfg/l3/vrrp/vr #/track`), this base priority value can be modified according to a number of performance and operational criteria.

adver *<1-255>*

> Defines the time interval between VRRP master advertisements. This can be any integer between 1 and 255 seconds. The default is 1.

preem disable|enable

> Enables or disables master preemption. When enabled, if the virtual router group is in backup mode but has a higher priority than the current master, this virtual router will preempt the lower priority master and assume control. Note that even when `preem` is disabled, this virtual router will always preempt any other master if this switch is the owner (the IP interface address and virtual router `addr` are the same). By default, this option is `enabled`.

Table 249   Virtual Router Group Options

Command Syntax and Usage

fadver

Enables or disables Fast Advertisements. When enabled, the VRRP master advertisements interval is calculated in units of centi-seconds, instead of seconds. For example, if **adver** is set to 1 and **fadver** is enabled, master advertisements are sent every .01 second.

When you disable fast advertisement, the advertisement interval is set to the default value of 1 second. To support Fast Advertisements, set the interval between 20-100 centi-seconds.

ena

Enables the virtual router group.

dis

Disables the virtual router group.

del

Deletes the virtual router group from the switch configuration.

cur

Displays the current configuration information for the virtual router group.

/cfg/l3/vrrp/group/track
Virtual Router Group Priority Tracking Configuration

```
[Virtual Router Group Priority Tracking Menu]
     ifs    - Enable/disable tracking other interfaces
     ports  - Enable/disable tracking VLAN switch ports
     cur    - Display current VRRP Group Tracking configuration
```

Note – If *Virtual Router Group Tracking* is enabled, then the tracking option will be available only under *group* option. The tracking setting for the other individual virtual routers will be ignored.

Table 250 Virtual Router Group Priority Tracking Options

Command Syntax and Usage

ifs disable|enable

> When enabled, the priority for this virtual router will be increased for each other IP interface active on this switch. An IP interface is considered active when there is at least one active port on the same VLAN. This helps elect the virtual routers with the most available routes as the master. This command is disabled by default.

ports disable|enable

> When enabled, the priority for this virtual router will be increased for each active port on the same VLAN. A port is considered "active" if it has a link and is forwarding traffic. This helps elect the virtual routers with the most available ports as the master. This command is disabled by default.

cur

> Displays the current configuration for priority tracking for this virtual router.

/cfg/l3/vrrp/if *<interface number>*
VRRP Interface Configuration

> **Note –** The *interface-number* represents the IP interface on which authentication parameters must be configured.

```
[VRRP Interface 1 Menu]
      auth    - Set authentication types
      passw   - Set plain-text password
      del     - Delete interface
      cur     - Display current VRRP interface configuration
```

This menu is used for configuring VRRP authentication parameters for the IP interfaces used with the virtual routers.

Table 251 VRRP Interface Options

Command Syntax and Usage

auth none|password

Defines the type of authentication that will be used: none (no authentication), or password (password authentication).

passw *<password>*

Defines a plain text password up to eight characters long. This password will be added to each VRRP packet transmitted by this interface when password authentication is chosen (see **auth** above).

del

Clears the authentication configuration parameters for this IP interface. The IP interface itself is not deleted.

cur

Displays the current configuration for this IP interface's authentication parameters.

/cfg/l3/vrrp/track
VRRP Tracking Configuration

```
[VRRP Tracking Menu]
     vrs    - Set priority increment for virtual router tracking
     ifs    - Set priority increment for IP interface tracking
     ports  - Set priority increment for VLAN switch port tracking
     cur    - Display current VRRP Priority Tracking configuration
```

This menu is used for setting weights for the various criteria used to modify priority levels during the master router election process. Each time one of the tracking criteria is met (see "VRRP Virtual Router Priority Tracking" on page 413), the priority level for the virtual router is increased by an amount defined through this menu.

Table 252   VRRP Tracking Options

Command Syntax and Usage

vrs *<0-254>*

Defines the priority increment value (0 through 254) for virtual routers in master mode detected on this switch. The default value is 2.

ifs *<0-254>*

Defines the priority increment value (0 through 254) for active IP interfaces detected on this switch. The default value is 2.

ports *<0-254>*

Defines the priority increment value (0 through 254) for active ports on the virtual router's VLAN. The default value is 2.

cur

Displays the current configuration of priority tracking increment values.

Note – These priority tracking options only define increment values. These options do not affect the VRRP master router election process until options under the VRRP Virtual Router Priority Tracking Menu (see page 413) are enabled.

/cfg/l3/gw6 *<gateway number>*
IPv6 Default Gateway Configuration

```
[Default IP6 gateway 1 Menu]
     addr     - Set IP address
     ena      - Enable default gateway
     dis      - Disable default gateway
     del      - Delete default gateway
     cur      - Display current default gateway configuration
```

The switch supports two IPv6 default gateways: 1 and 132. Gateway 132 is reserved for management.

The following table describes the IPv6 default gateway configuration options.

Table 253   IP6 Default Gateway Options

Command Syntax and Usage

addr   *<IPv6 address, such as 3001:0:0:0:0:0:abcd:12>*

Configures the IPv6 address of the default gateway, in hexadecimal format with colons.

ena

Enables the default gateway.

dis

Disables the default gateway.

del

Deletes the default gateway.

cur

Displays current IPv6 default gateway settings.

/cfg/l3/route6
IPv6 Static Route Configuration

```
[IP6 Static Route Menu]
     add      - Add static route
     rem      - Remove static route
     clear    - Clear static routes
     cur      - Display current IP6 static route configuration
```

The following table describes the IPv6 static route configuration options.

Table 254 IP6 Static Route Options

Command Syntax and Usage

add *<IPv6 address, such as 3001:0:0:0:0:0:abcd:12>* *<Prefix length>* *<gateway address>*
   [*<interface number>***]**

Adds an IPv6 static route.

rem *<IPv6 address, such as 3001:0:0:0:0:0:abcd:12>* *<Prefix length>* [*<interface number>*]

Removes the IPv6 static route.

clear

Clears IPv6 static routes. You are prompted to select the routes to clear, based on the
following criteria:

☐ **dest**: Destination IPv6 address of the route

☐ **gw**: Default gateway address used by the route

☐ **if**: Default interface used by the route

☐ **all**: All IPv6 static routes

cur

Displays the current IPv6 static route configuration.

`/cfg/l3/nbrcache`
IPv6 Neighbor Discovery Cache Configuration

```
[Static NBR Cache Menu]
    add      - Add a static NBR Cache entry
    del      - Delete a static NBR Cache entry
    clear    - Clear static neighbor cache table
    cur      - Display current static NBR Cache configuration
```

The following table describes the IPv6 Neighbor Discovery cache configuration options.

Table 255 Static NBR Cache Options

Command Syntax and Usage

add *<IPv6 address, such as 3001:0:0:0:0:0:abcd:12> <MAC address, such as 00:60:af:00:02:30> <VLAN number> <port number or alias>*

Adds a static entry to the Neighbor Discovery cache table. You are prompted for the following information:

- ☐ IP address
- ☐ MAC address
- ☐ VLAN number
- ☐ Port

del *<IPv6 address, such as 3001:0:0:0:0:0:abcd:12>*

Deletes the selected entry from the Neighbor Discovery cache table.

clear

Clears static entries in the Neighbor Discovery cache table. You are prompted to select the entries to clear, based on the following criteria:

- ☐ **IF**: Entries associated with the selected interface
- ☐ **VLAN**: Entries associated with the selected VLAN
- ☐ **Port**: Entries associated with the selected port
- ☐ **All**: All IPv6 Neighbor cache entries.

cur

Displays the current configuration of the Neighbor Discovery static cache table.

/cfg/l3/ip6pmtu
IPv6 Path MTU Configuration

```
[IP6 Path MTU Menu]
     timeout  - Set timeout duration of PMTU cache in minutes
     clear    - Clear IP6 Path MTU stats
     cur      - Display current PMTU configuration
```

The following table describes the configuration options for Path MTU (Maximum Transmission Unit). The Path MTU cache can consume system memory and affect performance. These commands allow you to manage the Path MTU cache.

Table 256   IPv6 Path MTU Options

Command Syntax and Usage

timeout 0|<*10-100*>

Sets the timeout value for Path MTU cache entries, in minutes. Enter 0 (zero) to set the timeout to infinity (no timeout).

The default value is 10 minutes.

clear

Clears all entries in the Path MTU cache.

cur

Displays the current Path MTU configuration.

/cfg/l3/ospf3
Open Shortest Path First Version 3 Configuration Menu

```
[Open Shortest Path First v3 Menu]
     aindex  - OSPFv3 Area (index) Menu
     range   - OSPFv3 Summary Range Menu
     summpref - OSPFv3 AS-External Range Menu
     if      - OSPFv3 Interface Menu
     virt    - OSPFv3 Virtual Links Menu
     host    - OSPFv3 Host Entry Menu
     rdstcfg - OSPFv3 Route Redistribute Entry Menu
     redist  - OSPFv3 Route Redistribution Menu
     abrtype - Set the alternative ABR type
     lsdb    - Set the LSDB limit for external LSA
     exoverfl - Set exit overflow interval in seconds
     refbw   - Set reference bandwidth for dflt intf metric calc
     spfdelay - Set delay between topology change and SPF calc
     spfhold - Set hold time between two consecutive SPF calc
     rtrid   - Set a fixed router ID
     nasbrdfr - Enable/disable set P-bit by an NSSA internal ASBR
     on      - Globally turn OSPFv3 ON
     off     - Globally turn OSPFv3 OFF
     cur     - Display current OSPFv3 configuration
```

Table 257   OSPFv3 Configuration Menu

Command Syntax and Usage

aindex   *<area index (0-2)>*

Displays the area index menu. This area index does not represent the actual OSPFv3 area number. See page 427 to view menu options.

range   *<1-16>*

Displays summary routes menu for up to 16 IP addresses. See page 429 to view menu options.

summpref   *<1-16>*

Displays the OSPFv3 summary prefix configuration menu. See page 430 to view menu options.

if   *<interface number>*

Displays the OSPFv3 interface configuration menu. See page 432 to view menu options.

virt   *<virtual link (1-3)>*

Displays the Virtual Links menu used to configure OSPFv3 for a Virtual Link. See page 434 to view menu options.

Table 257   OSPFv3 Configuration Menu

Command Syntax and Usage

host *<1-128>*

Displays the menu for configuring OSPFv3 for the host routes. Up to 128 host routes can be configured. Host routes are used for advertising network device IP addresses to external networks to perform server load balancing within OSPF. It also makes Area Border Route (ABR) load sharing and ABR failover possible. See page 435 to view menu options.

rdstcfg *<1-128>*

Displays the OSPF route redistribution entry menu. See page 436 to view menu options.

redist connected|**static**

Displays route redistribution menu. See page 437 to view menu options.

abrtype {standard|cisco|ibm}

Configures the Area Border Router (ABR) type, as follows:

- ☐   Standard
- ☐   Cisco
- ☐   IBM

The default setting is standard.

lsdb *<LSDB limit (0-2147483647)>***|none**

Sets the link state database limit.

exoverfl *<0-4294967295>*

Configures the number of seconds that a router takes to exit Overflow State. The default value is 0 (zero).

refbw *<0-4294967295>*

Configures the reference bandwidth, in kilobits per second, used to calculate the default interface metric. The default value is 100,000.

spfdelay *<0-65535>*

Configures the number of seconds that SPF calculation is delayed after a topology change message is received. The default value is 5.

spfhold *<0-65535>*

Configures the number of seconds between SPF calculations. The default value is 10.

Table 257   OSPFv3 Configuration Menu

Command Syntax and Usage

rtrid *<IP address>*

Defines the router ID.

---

nasbrdfr e|d

Enables or disables setting of the P-bit in the default Type 7 LSA generated by an NSSA internal ASBR. The default setting is disabled.

---

on

Enables OSPFv3 on the switch.

---

off

Disables OSPFv3 on the switch.

---

cur

Displays the current OSPF configuration settings.

/cfg/l3/ospf3/aindex *<area index>*
Area Index Configuration Menu

```
[OSPFv3 Area (index) 1 Menu]
 areaid   - Set area ID
 type     - Set area type
 metric   - Set metric for the default route into stub/NSSA area
 mettype  - Set default metric for stub/NSSA area
 stb      - Set stability interval for the NSSA area
 trnsrole - Set translation role for the NSSA area
 nosumm   - Enable/disable prevent sending summ LSA into stub/NSSA area
 enable   - Enable area
 disable  - Disable area
 delete   - Delete area
 cur      - Display current OSPF area configuration
```

Table 258 OSPFv3 Area Index Configuration Options

Command Syntax and Usage

areaid *<IP address (such as, 192.4.17.101)>*

Defines the IP address of the OSPFv3 area index.

type transit|**stub**|**nssa**

Defines the type of area. For example, when a virtual link has to be established with the backbone, the area type must be defined as transit.

Transit area: allows area summary information to be exchanged between routing devices. Any area that is not a stub area or NSSA is considered to be transit area.

Stub area: is an area where external routing information is not distributed. Typically, a stub area is connected to only one other area.

NSSA: Not-So-Stubby Area (NSSA) is similar to stub area with additional capabilities. For example, routes originating from within the NSSA can be propagated to adjacent transit and backbone areas. External routes from outside the Autonomous System (AS) can be advertised within the NSSA but are not distributed into other areas.

metric *<metric value (1-16777215)>*

Configures the cost for the default summary route in a stub area or NSSA.

mettype *<1-3>*

Configures the default metric type applied to the route.

This command applies only to area type of Stub/NSSA.

Table 258   OSPFv3 Area Index Configuration Options

Command Syntax and Usage

`stb` *<1-255>*

Configures the stability interval for an NSSA, in seconds. When the interval expires, an elected translator determines that its services are no longer required. The default value is 40.

`trnsrole always|candidate`

Configures the translation role for an NSSA area, as follows:

☐   `always`: Type 7 LSAs are always translated into Type 5 LSAs.

☐   `candidate`: An NSSA border router participates in the translator election process.

The default setting is `candidate`.

`nosumm e|d`

Enables or disables the no-summary option. When enabled, the area-border router neither originates nor propagates Inter-Area-Prefix LSAs into stub/NSSA areas. Instead it generates a default Inter-Area-Prefix LSA.

The default setting is `disabled`.

`enable`

Enables the OSPFv3 area.

`disable`

Disables the OSPFv3 area.

`delete`

Deletes the OSPFv3 area.

`cur`

Displays the current OSPFv3 area configuration.

/cfg/l3/ospf3/range *<range number>*
OSPFv3 Summary Range Configuration Menu

```
[OSPFv3 Summary Range 1  Menu]
     addr    - Set IPv6 address
     preflen - Set IPv6 prefix length
     aindex  - Set area index
     lsatype - Set LSA type for aggregation
     tag     - Set route tag
     hide    - Enable/disable hide range
     enable  - Enable range
     disable - Disable range
     delete  - Delete range
     cur     - Display current OSPFv3 summary range configuration
```

Table 259 OSPFv3 Summary Range Configuration Options

Command Syntax and Usage

addr *<IPv6 address>*

Configures the base IPv6 address for the range.

preflen *<IPv6 prefix length (1-128)>*

Configures the subnet IPv6 prefix length. The default value is 0 (zero).

aindex *<area index (0-2)>*

Configures the area index used by the switch.

lsatype summary|Type7

Configures the LSA type, as follows:

- ☐ Summary LSA
- ☐ Type7 LSA

tag *<0-4294967295>*

Configures the route tag.

hide disable|enable

Hides the OSPFv3 summary range.

enable

Enables the OSPFv3 summary range.

disable

Disables the OSPFv3 summary range.

Table 259 OSPFv3 Summary Range Configuration Options

Command Syntax and Usage

delete

Deletes the OSPFv3 summary range.

cur

Displays the current OSPFv3 summary range configuration.

/cfg/l3/ospf3/summpref *<range number>*
OSPFv3 AS-External Range Configuration Menu

```
[OSPFv3 AS-External Range 1  Menu]
     addr    - Set IPv6 address
     preflen - Set IPv6 prefix length
     aindex  - Set area index
     aggreff - Set aggregation effect
     transl  - Enable/disable set P-bit in the generated LSA
     enable  - Enable range
     disable - Disable range
     delete  - Delete range
     cur     - Display current OSPFv3 AS-External range configuration
```

Table 260 OSPFv3 AS_External Range Configuration Options

Command Syntax and Usage

addr *<IPv6 address>*

Configures the base IPv6 address for the range.

preflen *<IPv6 prefix length (1-128)>*

Configures the subnet IPv6 prefix length. The default value is 0 (zero).

aindex *<area index (0-2)>*

Configures the area index used by the switch.

Table 260   OSPFv3 AS_External Range Configuration Options

Command Syntax and Usage

`aggreff allowAll|denyAll|advertise|not-advertise`

Configures the aggregation effect, as follows:

- ☐ **`allowAll`**: If the area ID is 0.0.0.0, aggregated Type-5 LSAs are generated. Aggregated Type-7 LSAs are generated in all the attached NSSAs for the range.
- ☐ **`denyAll`**: Type-5 and Type-7 LSAs are not generated.
- ☐ **`advertise`**: If the area ID is 0.0.0.0, aggregated Type-5 LSAs are generated. For other area IDs, aggregated Type-7 LSAs are generated in the NSSA area.
- ☐ **`not-advertise`**: If the area ID is 0.0.0.0, Type-5 LSAs are not generated, while all NSSA LSAs within the range are cleared and aggregated Type-7 LSAs are generated for all NSSAs. For other area IDs, aggregated Type-7 LSAs are not generated in the NSSA area.

`transl e|d`

When enabled, the P-bit is set in the generated Type-7 LSA. When disabled, the P-bit is cleared. The default setting is `disabled`.

`enable`

Enables the OSPFv3 AS-external range.

`disable`

Disables the OSPFv3 AS-external range.

`delete`

Deletes the OSPFv3 AS-external range.

`cur`

Displays the current OSPFv3 AS-external range.

/cfg/l3/ospf3/if *<interface number>*
OSPFv3 Interface Configuration Menu

```
[OSPFv3 Interface 1  Menu]
     aindex   - Set area index
     instance - Set instance id
     prio     - Set interface router priority
     cost     - Set interface cost
     hello    - Set hello interval in seconds
     dead     - Set dead interval in seconds
     transm   - Set transmit delay in seconds
     retra    - Set retransmit interval in seconds
     passive  - Enable/disable passive interface
     enable   - Enable interface
     disable  - Disable interface
     delete   - Delete interface
     cur      - Display current OSPFv3 interface configuration
```

Table 261 OSPFv3 Interface Configuration Options

Command Syntax and Usage

aindex *<area index (0-2)>*

Configures the OSPFv3 area index.

instance *<0-255>*

Configures the instance ID for the interface.

prio *<priority value (0-255)>*

Configures the priority value for the switch's OSPFv3 interface.

A priority value of 255 is the highest and 1 is the lowest. A priority value of 0 specifies that the interface cannot be used as Designated Router (DR).

cost *<1-65535>*

Configures the metric value for sending a packet on the interface.

hello *<1-65535>*

Configures the indicated interval, in seconds, between the hello packets, that the router sends on the interface.

dead *<1-65535>*

Configures the time period, in seconds, for which the router waits for hello packet from the neighbor before declaring this neighbor down.

Table 261   OSPFv3 Interface Configuration Options

Command Syntax and Usage

transm *<1-1800>*

Configures the estimated time, in seconds, taken to transmit LS update packet over this interface.

retra *<1-1800>*

Configures the interval in seconds, between LSA retransmissions for adjacencies belonging to interface.

passive enable|disable

Enables or disables the passive setting on the interface. On a passive interface, OSPFv3 protocol packets are suppressed.

enable

Enables the OSPFv3 interface.

disable

Disables the OSPFv3 interface.

delete

Deletes the OSPFv3 interface.

cur

Displays the current settings for OSPFv3 interface.

/cfg/l3/ospf3/virt *<link number>*
OSPFv3 Virtual Link Configuration Menu

```
[OSPFv3 Virtual Link 1  Menu]
     aindex   - Set area index
     hello    - Set hello interval in seconds
     dead     - Set dead interval in seconds
     trans    - Set transit delay in seconds
     retra    - Set retransmit interval in seconds
     nbr      - Set router ID of virtual neighbor
     enable   - Enable interface
     disable  - Disable interface
     delete   - Delete interface
     cur      - Display current OSPFv3 interface configuration
```

Table 262 OSPFv3 Virtual Link Configuration Options

Command Syntax and Usage

aindex *<area index (0-2)>*

Configures the OSPFv3 area index.

hello *<1-65535>*

Configures the indicated interval, in seconds, between the hello packets, that the router sends on the interface.

dead *<1-65535>*

Configures the time period, in seconds, for which the router waits for hello packet from the neighbor before declaring this neighbor down.

trans *<1-1800>*

Configures the estimated time, in seconds, taken to transmit LS update packet over this interface.

retra *<1-1800>*

Configures the interval, in seconds, between link-state advertisement (LSA) retransmissions for adjacencies belonging to the OSPFv3 virtual link interface. The default value is five seconds.

nbr *<NBR router ID (IP address)>*

Configures the router ID of the virtual neighbor. The default setting is 0.0.0.0

enable

Enables OSPFv3 virtual link.

Table 262 OSPFv3 Virtual Link Configuration Options

Command Syntax and Usage

disable

Disables the OSPFv3 virtual link.

delete

Deletes the OSPFv3 virtual link.

cur

Displays the current OSPFv3 virtual link settings.

/cfg/l3/ospf3/host *<host number>*
OSPFv3 Host Entry Configuration Menu

```
[OSPF Host Entry 1 Menu]
      addr   - Set host entry IP address
      aindex - Set area index
      cost   - Set cost of this host entry
      enable - Enable host entry
      disable - Disable host entry
      delete - Delete host entry
      cur    - Display current OSPF host entry configuration
```

Table 263 OSPFv3 Host Entry Configuration Options

Command Syntax and Usage

addr *<IPv6 address>*

Configures the base IPv6 address for the host entry.

aindex *<area index (0-2)>*

Configures the area index of the host.

cost *<1-65535>*

Configures the cost value of the host.

enable

Enables OSPF host entry.

disable

Disables OSPF host entry.

Table 263 OSPFv3 Host Entry Configuration Options

Command Syntax and Usage

delete

Deletes OSPF host entry.

cur

Displays the current OSPF host entries.

/cfg/l3/ospf3/rdstcfg *<1-128>*
OSPFv3 Redist Entry Configuration Menu

```
[OSPFv3 Redist Entry 1 Menu]
     addr     - Set redist entry IPv6 address
     preflen  - Set IPv6 prefix length
     metric   - Set metric to be applied to the route
     mettype  - Set metric type
     tag      - Set route tag
     enable   - Enable redist entry
     disable  - Disable redist entry
     delete   - Delete redist entry
     cur      - Display current OSPF redist entry configuration
```

Table 264 OSPFv3 Redist Entry Configuration Options

Command Syntax and Usage

addr *<IPv6 address>*

Configures the base IPv6 address for the redistribution entry.

preflen *<IPv6 prefix length (1-128)>*

Configures the subnet IPv6 prefix length. The default value is 64.

metric *<1-16777215>*

Configures the route metric value applied to the route before it is advertised into the OSPFv3 domain.

mettype asExttype1|asExttype2

Configures the metric type applied to the route before it is advertised into the OSPFv3 domain.

tag *<0-4294967295>*|**unset**

Configures the route tag. To clear the route tag, enter **unset**.

Table 264 OSPFv3 Redist Entry Configuration Options

Command Syntax and Usage

enable

Enables the OSPFv3 redistribution entry.

disable

Disables the OSPFv3 redistribution entry.

delete

Deletes the OSPFv3 redistribution entry.

cur

Displays the current OSPFv3 redistribution configuration entries.

/cfg/l3/ospf3/redist connected|static
OSPFv3 Redistribute Configuration Menu

```
[OSPF Redistribute Static  Menu]
     export   - Export all routes of this protocol
     cur      - Display current redistribution setting
```

Table 265 OSPFv3 Redistribute Configuration Options

Command Syntax and Usage

export [<*metric value (1-16777215)>*|**none] [**<*metric type (1-2)>*]
   [<*tag (0-4294967295)>*|**unset]**

Exports the routes of this protocol as external OSPFv3 AS-external LSAs in which the metric, metric type, and route tag are specified. To remove a previous configuration and stop exporting the routes of the protocol, enter none.

To clear the route tag, enter unset.

cur

Displays the current OSPFv3 route redistribution settings.

`/cfg/l3/ndprefix`
IPv6 Neighbor Discovery Prefix Configuration

```
[IP6 Neighbor Discovery Prefix Menu]
     profile  - Profile of ND Prefix
     add      - Add Neighbour Discovery Prefix
     rem      - Remove Neighbour Discovery Prefix
     clear    - Clear Neighbour Discovery Prefix
     cur      - Display current Neighbour Discovery Prefix configuration
```

The following table describes the Neighbor Discovery prefix configuration options. These commands allow you to define a list of prefixes to be placed in Prefix Information options in Router Advertisement messages sent from an interface.

Table 266   IPv6 Neighbor Discovery Prefix Options

Command Syntax and Usage

profile *<1-127>*

Displays the Neighbor Discovery Profile menu. You can configure up to 127 profiles. You must attach a profile to each Neighbor Discovery prefix.

add **{***<IPv6 prefix>* *<prefix length>* *<interface number>* *<profile index>***}**

Adds a Neighbor Discovery prefix to an interface.

Note: A profile index of 0 (zero) adds the default profile, as follows:

- □ Prefix Advertisement: enabled
- □ Valid Lifetime: 2592000
- □ Valid Lifetime Fixed Flag: enabled
- □ Preferred Lifetime: 604800
- □ Preferred Lifetime Fixed Flag: enabled
- □ On-link Flag: enabled
- □ Autonomous Flag: enabled

rem **{***<IPv6 prefix>* *<prefix length>***}**

Removes a Neighbor Discovery prefix.

clear *<interface number>***|all**

Clears the selected Neighbor Discovery prefixes. If you include an interface number, all ND prefixes for that interface are cleared.

cur

Displays current Neighbor Discovery prefix parameters.

/cfg/l3/ndprefix/profile *<1-127>*
IPv6 Neighbor Discovery Profile Configuration

```
[IP6 Neighbor Discovery Profile 1 Menu]
    valft   - Set Prefix Valid lifetime
    valftfix - Set Prefix Valid lifetime FIXED Flag
    prlft   - Set Prefix Preferred lifetime
    prlftfix - Set Prefix Preferred lifetime FIXED Flag
    onlink  - Set Prefix on-link Flag
    autoflag - Set Prefix Autonomous Flag
    ena      - Enable Prefix advertisement
    dis      - Disable Prefix advertisement
    del      - Delete profile
    cur      - Display current Neighbor Discovery Prefix configuration
```

The following table describes the Neighbor Discovery Profile configuration options.Information in the ND profile can be used to supplement information included in an ND prefix.

Table 267 IPv6 Neighbor Discovery Profile Options

Command Syntax and Usage

valft *<0-4294967295>*

Configures the Valid Lifetime of the prefix, in seconds. The Valid Lifetime is the length of time (relative to the time the packet is sent) that the prefix is valid for the purpose of on-link determination. Enter the maximum value to configure a Valid Lifetime of infinity.

The default value is 2592000.

valftfix enable|disable

Enables of disables the Valid Lifetime fixed flag. When enabled, the Valid Lifetime value represents a fixed time that stays the same in consecutive advertisements.

When disabled, the Valid Lifetime value represents a time that decrements in real time, that is, one that will result in a value of zero at a specified time in the future.

The default setting is enabled.

prlft *<0-4294967295>*

Configures the Preferred Lifetime of the prefix, in seconds. The Preferred Lifetime is the length of time (relative to the time the packet is sent) that addresses generated from the prefix via stateless address autoconfiguration remain preferred. Enter the maximum value to configure a Preferred Lifetime value of infinity.

The default value is 604800.

Note: The Preferred Lifetime value must not exceed the Valid Lifetime value.

Table 267   IPv6 Neighbor Discovery Profile Options

Command Syntax and Usage

prlftfix enable|disable

Enables or disables the Preferred Lifetime fixed flag. When enabled, the Preferred Lifetime value represents a fixed time that stays the same in consecutive advertisements.

When disabled, the Preferred Lifetime value represents a time that decrements in real time, that is, one that will result in a value of zero at a specified time in the future.

The default setting is `enabled`.

onlink enable|disable

Enables or disables the on-link flag. When enabled, indicates that this prefix can be used for on-link determination. When disabled, the advertisement makes no statement about on-link or off-link properties of the prefix.

The default setting is `enabled`.

autoflag enable|disable

Enables or disables the autonomous flag. When enabled, indicates that the prefix can be used for stateless address configuration.

The default setting is `enabled`.

ena

Enables the selected profile.

dis

Disables the selected profile

del

Delete the selected Neighbor Discovery profile.

cur

Displays the current Neighbor Discovery profile parameters.

/cfg/l3/ppt
IPv6 Prefix Policy Table Configuration

```
[Prefix Policy Table Menu]
     add      - Add prefix Policy
     rem      - Remove prefix policy
     cur      - Display prefix policy table
```

The following table describes the configuration options for the IPv6 Prefix Policy Table. The Prefix Policy Table allows you to override the default address selection criteria.

Table 268   IPv6 Prefix Policy Table Options

Command Syntax and Usage

add *<IPv6 prefix> <prefix length> <precedence (0-100)> <label (0-100)>*

Adds a Prefix Policy Table entry. Enter the following parameters:

- ☐ IPv6 address prefix
- ☐ Prefix length
- ☐ **Precedence**: The precedence is used to sort destination addresses. Prefixes with a higher precedence are sorted before those with a lower precedence.
- ☐ **Label**: The label allows you to select prefixes based on matching labels. Source prefixes are coupled with destination prefixes if their labels match.

rem *<IPv6 prefix> <prefix length> <precedence> <label>*

Removes a prefix policy table entry.

cur

Displays the current Prefix Policy Table configuration.

/cfg/l3/loopif *<interface number (1-5)>*
IP Loopback Interface Configuration

```
[IP Loopback Interface 2 Menu]
     addr      - Set IP address
     mask      - Set subnet mask
     ena       - Enable IP interface
     dis       - Disable IP interface
     del       - Delete IP interface
     cur       - Display current interface configuration
```

An IP loopback interface is not connected to any physical port. A loopback interface is always accessible over the network.

Table 269 IP Loopback Interface Options

Command Syntax and Usage

addr *<IP address>*

Defines the loopback interface IP address.

mask *<subnet mask>*

Defines the loopback interface subnet mask.

ena

Enables the loopback interface.

dis

Disables the loopback interface.

del

Deletes the selected loopback interface.

cur

Displays the current IP loopback interface parameters.

/cfg/rmon
Remote Monitoring Configuration

```
[RMON Menu]
     hist    - RMON History Menu
     event   - RMON Event Menu
     alarm   - RMON Alarm Menu
     cur     - Display current RMON configuration
```

Remote Monitoring (RMON) allows you to monitor traffic flowing through the switch. The RMON MIB is described in RFC 1757.

Table 270 describes the Remote Monitoring (RMON) configuration menu options.

Table 270   Remote Monitoring (RMON) Configuration Options

Command Syntax and Usage

hist *<1-65535>*

Displays the RMON History Configuration menu. To view menu options, see page 444.

event *<1-65535>*

Displays the RMON Event Configuration menu. To view menu options, see page 445.

alarm *<1-65535>*

Displays the RMON Alarm Configuration menu. To view menu options, see page 446.

cur

Displays the current RMON parameters.

/cfg/rmon/hist *<1-65535>*
RMON History Configuration Menu

```
[RMON History 2 Menu]
     ifoid    - Set interface MIB object to monitor
     rbnum    - Set the number of requested buckets
     intrval  - Set polling interval
     owner    - Set owner for the RMON group of statistics
     delete   - Delete this history and restore defaults
     cur      - Display current history configuration
```

Table 271 describes the RMON History Menu options.

Table 271　RMON History Options

Command Syntax and Usage

ifoid *<1-127 characters>*

Configures the interface MIB Object Identifier. The IFOID must correspond to the standard interface OID, as follows:

1.3.6.1.2.1.2.2.1.1.x

where x is the ifIndex

rbnum *<1-65535>*

Configures the requested number of buckets, which is the number of discrete time intervals over which data is to be saved. The default value is 30.

The maximum number of buckets that can be granted is 50.

intrval *<1-3600>*

Configures the time interval over which the data is sampled for each bucket.

The default value is 1800.

owner *<1-127 characters>*

Enter a text string that identifies the person or entity that uses this History index.

delete

Deletes the selected History index.

cur

Displays the current RMON History parameters.

/cfg/rmon/event *<1-65535>*
RMON Event Configuration Menu

```
[RMON Event 2 Menu]
     descn    - Set description for the event
     type     - Set event type
     owner    - Set owner for the event
     delete   - Delete this event and restore defaults
     cur      - Display current event configuration
```

Table 272 describes the RMON Event Menu options.

Table 272   RMON Event Options

Command Syntax and Usage

descn *<1-127 characters>*

Enter a text string to describe the event.

type none|log|trap|both

Selects the type of notification provided for this event. For log events, an entry is made in the log table and sent to the configured syslog host. For trap events, an SNMP trap is sent to the management station.

owner *<1-127 characters>*

Enter a text string that identifies the person or entity that uses this event index.

delete

Deletes the selected RMON Event index.

cur

Displays the current RMON Event parameters.

/cfg/rmon/alarm *<1-65535>*
RMON Alarm Configuration Menu

```
[RMON Alarm 2 Menu]
    oid      - Set MIB oid datasource to monitor
    intrval  - Set alarm interval
    sample   - Set sample type
    almtype  - Set startup alarm type
    rlimit   - Set rising threshold
    flimit   - Set falling threshold
    revtidx  - Set event index to fire on rising threshold crossing
    fevtidx  - Set event index to fire on falling threshold crossing
    owner    - Set owner for the alarm
    delete   - Delete this alarm and restore defaults
    cur      - Display current alarm configuration
```

The Alarm RMON group can track rising or falling values for a MIB object. The MIB object must be a counter, gauge, integer, or time interval. Each alarm index must correspond to an event index that triggers once the alarm threshold is crossed.

Table 273 describes the RMON Alarm Menu options.

Table 273   RMON Alarm Options

Command Syntax and Usage

oid *<1-127 characters>*

Configures an alarm MIB Object Identifier.

intrval *<1-65535>*

Configures the time interval over which data is sampled and compared with the rising and falling thresholds. The default value is 1800.

sample abs|delta

Configures the method of sampling the selected variable and calculating the value to be compared against the thresholds, as follows:

□   abs—absolute value, the value of the selected variable is compared directly with the thresholds at the end of the sampling interval.

□   delta—delta value, the value of the selected variable at the last sample is subtracted from the current value, and the difference compared with the thresholds.

almtype rising|falling|either

Configures the alarm type as rising, falling, or either (rising or falling).

Table 273 RMON Alarm Options

Command Syntax and Usage

rlimit *<-2147483647 - 2147483647>*

Configures the rising threshold for the sampled statistic. When the current sampled value is greater than or equal to this threshold, and the value at the last sampling interval was less than this threshold, a single event is generated.

flimit *<-2147483647 - 214748364)*

Configures the falling threshold for the sampled statistic. When the current sampled value is less than or equal to this threshold, and the value at the last sampling interval was greater than this threshold, a single event is generated.

revtidx *<1-65535>*

Configures the rising alarm event index that is triggered when a rising threshold is crossed.

fevtidx *<1-65535>*

Configures the falling alarm event index that is triggered when a falling threshold is crossed.

owner *<1-127 characters>*

Enter a text string that identifies the person or entity that uses this alarm index.

delete

Deletes the selected RMON Alarm index.

cur

Displays the current RMON Alarm parameters.

/cfg/virt
Virtualization Configuration

```
[Virtualization Menu]
     vmpolicy - Virtual Machines Policy Configuration Menu
     vmgroup  - Virtual Machines Groups Menu
     vmprof   - Virtual Machine Profiles Menu
     vmware   - VMware-specific Settings Menu
     enavmr   - Enable VMready
     disvmr   - Disable VMready
     cur      - Display all current virtualization settings
```

Table 274 describes the general virtualization configuration options. More detailed information is available in the following sections.

Table 274   Virtualization Configuration Options

Command Syntax and Usage

vmpolicy

Displays the Virtual Machines Policy menu. To view menu options, see page 449.

vmgroup *<1-1024>*

Displays the Virtual Machine Groups menu. To view menu options, see page 451.

vmprof

Displays the Virtual Machine Profiles menu. To view menu options, see page 453.

vmware

Displays the VMware settings menu. To view menu options, see page 455.

enavmr

Enables VMready. Before you enable VMready, you must define one or more server ports. See "Server Port Configuration" on page 263.

disvmr

Disables VMready.

cur

Displays the current virtualization parameters.

/cfg/virt/vmpolicy
Virtual Machines Policy Configuration

```
[VM Policy Configuration Menu]
     vmbwidth -  VM Bandwidth Configuration Menu
```

Table 275 describes the Virtual Machines (VM) policy configuration options.

Table 275 VM Policy Options

Command Syntax and Usage

vmbwidth *<MAC address>***|***<UUID>***|***<name>***|***<IP address>***|***<index number>*

Displays the bandwidth management menu for the selected Virtual Machine. Enter a unique identifier to select a VM.

/cfg/virt/vmpolicy/vmbwidth *<VM identifier>*
VM Policy Bandwidth Management

```
[VM Bandwidth Management Menu]
   txrate - Set VM Transmit Bandwidth (Ingress for switch)
   bwctrl - Enable/Disable VM Bandwidth Control
   delete - Delete VM bandwidth control Entry
   cur - Display current VM bandwidth configuration
```

Table 276 describes the bandwidth management options for the selected VM. Use these commands to limit the bandwidth used by each VM.

Table 276 VM Bandwidth Management Options

Command Syntax and Usage

txrate *<64-10000000>* **[32|64|128|256|512|1024|2048|4096]** *<1-512>*

The first value configures Committed Rate—the amount of bandwidth available to traffic transmitted from the VM to the switch, in kilobits per second. Enter the value in multiples of 64.

The second values configures the maximum burst size, in kilobits. Enter one of the following values: 32, 64, 128, 256, 512, 1024, 2048, 4096.

The third value represents the ACL assigned to the transmission rate. The ACL is automatically, in sequential order, if not specified by the user. If there are no available ACLs, the TXrate cannot be configured. Each TXrate configuration reduces the number of available ACLs by one.

Table 276   VM Bandwidth Management Options

Command Syntax and Usage

bwctrl e|d

Enables or disables bandwidth control on the VM policy.

delete

Deletes the bandwidth management settings from this VM policy.

cur

Displays the current VM bandwidth management parameters.

`/cfg/virt/vmgroup` *<1-1024>*
VM Group Configuration

```
[VM group 1 Menu]
   vlan     - Set the group's vlan (only for groups with no VM profile)
   vmap     - Set VMAP for this group
   tag      - Enable vlan tagging on all VM group ports
   addvm    - Add a virtual entity to the group
   remvm    - Remove a virtual entity from the group
   addprof  - Add a VM profile to the group
   remprof  - Delete any VM profile associated with the group
   addport  - Add ports to the group
   remport  - Remove ports from the group
   addtrunk - Add trunk to the group
   remtrunk - Remove trunk from the group
   addkey   - Add LACP trunk to the group
   remkey   - Remove LACP trunk from the group
   stg      - Assign VM group vlan to a Spanning Tree Group
   del      - Delete group
   cur      - Display current group configuration
```

Table 277 describes the Virtual Machine (VM) group configuration options. A VM group is a collection of members, such as VMs, ports, or trunk groups. Members of a VM group share certain properties, including VLAN membership, ACLs (VMAP), and VM profiles.

Table 277 VM Group Options

Command Syntax and Usage

vlan *<VLAN number>*

Assigns a VLAN to this VM group. If you do not assign a VLAN to the VM group, the switch automatically assigns an unused VLAN when adding a port or a VM to the VM Group.

Note: If you add a VM profile to this group, the group will use the VLAN assigned to the profile.

vmap add|rem *<VMAP number>* **serverports|non-serverports**

Assigns the selected VLAN Map to this VM group. You can choose to limit operation of the VLAN Map to server ports only or non-server ports only. If you do not select a port type, the VMAP is applied to the entire VM Group.

For more information about configuring VLAN Maps, see "VLAN MAP Configuration" on page 295.

tag e|d

Enables or disables VLAN tagging on ports in this VM group.

Table 277 VM Group Options

Command Syntax and Usage

addvm *<MAC address>* **|** *<UUID>* **|** *<name>* **|** *<IP address>* **|** *<index number>*

Adds a VM to the VM group. Enter a unique identifier to select a VM.
The UUID and name parameters apply only if Virtual Center information is configured
(**/cfg/virt/vmware/vcspec**).
The VM index number is found in the VM information dump (**/info/virt/vm/dump**).

Note: If the VM is connected to a port that is contained within the VM group, do not add the VM to the VM group.

remvm *<MAC address>* **|** *<UUID>* **|** *<name>* **|** *<IP address>* **|** *<index number>*

Removes a VM from the VM group. Enter a unique identifier to select a VM.
The UUID and name parameters apply only if Virtual Center information is configured
(**/cfg/virt/vmware/vcspec**).
The VM index number is found in the VM information dump (**/info/virt/vm/dump**).

addprof *<profile name (1-39 characters)>*

Adds the selected VM profile to the VM group.

remprof

Removes the VM profile assigned to the VM group.

addport *<port number or alias>*

Adds the selected port to the VM group.

Note: Add a port to a VM group only if no VMs on that port are members of the VM group.

remport *<port number or alias>*

Removes the selected port from the VM group.

addtrunk *<trunk number>*

Adds the selected trunk group to the VM group.

remtrunk *<trunk number>*

Removes the selected trunk group from the VM group.

addkey *<1-65535>*

Adds an LACP *admin key* to the VM group. LACP trunks formed with this admin key will be included in the VM group.

Table 277   VM Group Options

Command Syntax and Usage

remkey *<1-65535>*

Removes an LACP *admin key* from the VM group.

stg *<STG number>*

Assigns the VM group to a Spanning Tree Group (STG).

del

Deletes the VM group.

cur

Displays the current VM group parameters.

/cfg/virt/vmprof
VM Profile Configuration

```
[VM Profiles Menu]
     create   - Create a VM profile
     edit     - Edit a VM profile
     cur      - Display details of all VM profiles
```

Configuration of VMs with the VM Agent requires the use of VM profiles, which ease the configuration and management of VM Agent-based VM groups. The VM profile contains a set of properties that will be configured on the Virtual Switch.

After a VM profile has been defined, it can be assigned to a VM group or exported to one or more VMware hosts.

Table 278 describes the VM Profiles configuration options.

Table 278   VM Profile Options

Command Syntax and Usage

create *<profile name (1-39 characters)>*

Defines a name for the VM profile. The switch supports up to 32 VM profiles.

Table 278   VM Profile Options

Command Syntax and Usage

edit *<profile name>*

Displays the VM Profile Edit menu for the selected profile. To view menu options, see page 454.

cur

Displays the current VM Profiles parameters.

/cfg/virt/vmprof/edit *<profile name>*
VM Profile Edit

```
[VM profile "myProfile" Menu]
   vlan     - Set the VM profile's VLAN ID
   shaping  - Set or delete the VM profile's traffic shaping parameters
   delete   - Delete this VM profile
   cur      - Show details of the current VM profile
```

Table 279 describes the VM Profile Edit options.

Table 279   Edit VM Profile Options

Command Syntax and Usage

vlan *<VLAN number>*

Assigns a VLAN to the VM profile.

shaping [*<average (1-1000000000)> <burst (1-1000000000)>*
   *<peak (1-1000000000)>***]|delete**

Configures traffic shaping parameters implemented in the hypervisor, as follows:

☐   Average traffic, in Kilobits per second

☐   Maximum burst size, in Kilobytes

☐   Peak traffic, in Kilobits per second

☐   Delete traffic shaping parameters.

delete

Deletes the selected VM Profile.

cur

Displays the current VM Profiles parameters.

/cfg/virt/vmware
VM Ware Configuration

```
[VMware-specific Settings Menu]
  hbport    - Set ESX/ESXi server to vCenter heartbeat UDP port number
  vcspec    - Create, update or delete Virtual Center access information
  cur       - Display current VMware-specific settings
```

Table 280 describes the VMware configuration options. When the user configures the VMware Virtual Center, the VM Agent module in the switch can perform advanced functionality by communicating with the VMware management console. The Virtual Center provides VM and Host names, IP addresses, Virtual Switch and port group information. The VM Agent on the switch communicates with the Virtual Center to synchronize VM profiles between the switch and the VMware virtual switch.

Table 280 VMware Options

Command Syntax and Usage

hbport *<1-65535>*

Configures the UDP port number used for heartbeat communication from the VM host to the Virtual Center. The default value is port 902.

vcspec [<*IP address*>**|[**<*username*> **noauth]|[delete]**

Defines the Virtual Center credentials on the switch. Once you configure the Virtual Center, VM Agent functionality is enabled across the system.

You are prompted for the following information:

☐ IP address of the Virtual Center

☐ User name and password for the Virtual Center

☐ Whether to authenticate the SSL security certificate (yes or no)

cur

Displays the current VMware parameters.

`/cfg/setup`
Setup

The setup program steps you through configuring the system date and time, BOOTP, IP, Spanning Tree, port speed/mode, VLAN parameters, and IP interfaces.

To start the setup program, at the `Configuration#` prompt, enter:

```
Configuration# setup
```

For a complete description of how to use `setup`, see "First-Time Configuration" on page 27.

`/cfg/dump`
Dump

The dump program writes the current switch configuration to the terminal screen. To start the dump program, at the `Configuration#` prompt, enter:

```
Configuration# dump
```

The configuration is displayed with parameters that have been changed from the default values. The screen display can be captured, edited, and placed in a script file, which can be used to configure other switches through a Telnet connection. When using Telnet to configure a new switch, paste the configuration commands from the script file at the command line prompt of the switch. The active configuration can also be saved or loaded via TFTP, as described on page 457.

`/cfg/ptcfg` *<FTP/TFTP server> <filename>*
Saving the Active Switch Configuration

When the `ptcfg` command is used, the switch's active configuration commands (as displayed using `/cfg/dump`) will be uploaded to the specified script configuration file on the FTP/TFTP server. To start the switch configuration upload, at the `Configuration#` prompt, enter:

```
Configuration# ptcfg <FTP or TFTP server> <filename>
```

Where *server* is the FTP/TFTP server IPv4/IPv6 address or hostname, and *filename* is the name of the target script configuration file. The output file is formatted with line-breaks but no carriage returns—the file cannot be viewed with editors that require carriage returns (such as Microsoft Notepad).

> **Note –** If the FTP/TFTP server is running SunOS or the Solaris operating system, the specified `ptcfg` file must exist prior to executing the `ptcfg` command and must be writable (set with proper permission, and not locked by any application). The contents of the specified file will be replaced with the current configuration data.

/cfg/gtcfg *<FTP/TFTP server>* *<filename>*
Restoring the Active Switch Configuration

When the `gtcfg` command is used, the active configuration will be replaced with the commands found in the specified configuration file. The file can contain a full switch configuration or a partial switch configuration. The configuration loaded using `gtcfg` is not activated until the `apply` command is used. If the `apply` command is found in the configuration script file loaded using this command, the apply action will be performed automatically.

To start the switch configuration download, at the `Configuration#` prompt, enter:

```
Configuration# gtcfg <FTP or TFTP server> <filename>
```

Where *server* is the FTP/TFTP server IPv4/IPv6 address or hostname, and *filename* is the name of the target script configuration file.

CHAPTER 7
The Operations Menu

The Operations menu is generally used for commands that affect switch performance immediately, but do not alter permanent switch configurations. For example, you can use the Operations menu to immediately disable a port (without the need to apply or save the change), with the understanding that when the switch is reset, the port returns to its normally configured operation.

/oper
Operations Menu

```
[Operations Menu]
     port     - Operational Port Menu
     vrrp     - Operational Virtual Router Redundancy Menu
     ip       - Operational IP Menu
     sys      - Operational System Menu
     virt     - Virtualization Operations Menu
     passwd   - Change current user password
     clrlog   - Clear syslog messages
     tnetsshc - Close all telnet/SSH connections
     cfgtrk   - Track last config change made
     ntpreq   - Send NTP request
```

The commands of the Operations menu enable you to alter switch operational characteristics without affecting switch configuration.

Table 281   Operations Menu Options

Command Syntax and Usage

---

port *<port alias or number>*

Displays the Operational Port menu. To view menu options, see .

---

vrrp

Displays the Operational Virtual Router Redundancy menu. To view menu options, see .

---

ip

Displays the IP Operations menu, which has one sub-menu/option, the Operational Border Gateway Protocol Menu. To view menu options, see .

---

passwd *<1-128 characters>*

Allows the user to change the password. You need to enter the current password in use for validation.

---

clrlog

Clears all Syslog messages.

---

tnetsshc

Closes all open Telnet and SSH connections.

---

conlog enable|disable

Enables of disables console logging of the current session.

---

cfgtrk

Displays a list of configuration changes made since the last apply command. Each time the apply command is sent, the configuration-tracking log is cleared.

---

ntpreq

Allows the user to send requests to the NTP server.

---

sys

Displays the Operational System menu. To view menu options, see .

/oper/port *<port alias or number>*
Operations-Level Port Options

```
[Operations Port 1 Menu]
     8021x    - 8021.x Menu
     ena      - Enable port
     dis      - Disable port
     lena     - Enable FDB Learning
     ldis     - Disable FDB Learning
     cur      - Current port state
```

Operations-level port options are used for temporarily disabling or enabling a port, and for re-setting the port.

Table 282   Operations-Level Port Options

Command Syntax and Usage

8021x

Displays the 802.1X Port menu. To view menu options, see .

ena

Temporarily enables the port. The port will be returned to its configured operation mode when the switch is reset.

dis

Temporarily disables the port. The port will be returned to its configured operation mode when the switch is reset.

lena

Temporarily enables FDB learning on the port.

ldis

Temporarily disables FDB learning on the port.

cur

Displays the current settings for the port.

/oper/port *<port alias or number>*/8021x
Operations-Level Port 802.1X Options

```
[802.1X Operation Menu]
     reset   - Reinitialize 802.1X access control on this port
     reauth  - Initiate reauthentication on this port now
```

Operations-level port 802.1X options are used to temporarily set 802.1X parameters for a port.

Table 283   Operations-Level Port 802.1X Options

Command Syntax and Usage

reset

Re-initializes the 802.1X access-control parameters for the port. The following actions take place, depending on the 802.1X port configuration:

☐ **force unauth** - the port is placed in unauthorized state, and traffic is blocked.

☐ **auto** - the port is placed in unauthorized state, then authentication is initiated.

☐ **force auth** - the port is placed in authorized state, and authentication is not required.

reauth

Re-authenticates the supplicant (client) attached to the port. This command only applies if the port's 802.1X mode is configured as auto.

Operations-Level VRRP Options

```
[VRRP Operations Menu]
        back   - Set virtual router to backup
```

Table 284 Operations-Level VRRP Options

Command Syntax and Usage

back {<*virtual router number (1-255)>*|**group}**

Forces the specified master virtual router on this switch into backup mode. This is generally used for passing master control back to a preferred switch once the preferred switch has been returned to service after a failure. When this command is executed, the current master gives up control and initiates a new election by temporarily advertising its own priority level as 0 (lowest). After the new election, the virtual router forced into backup mode by this command will resume master control in the following cases:

☐ This switch owns the virtual router (the IP addresses of the virtual router and its IP interface are the same)

☐ This switch's virtual router has a higher priority and preemption is enabled.

☐ There are no other virtual routers available to take master control.

`/oper/ip`
Operations-Level IP Options

```
[IP Operations Menu]
     bgp     - Operational Border Gateway Protocol Menu
```

Table 285 Operations-Level IP Options

Command Syntax and Usage

bgp

Displays the Border Gateway Protocol Operations menu. To view the menu options see .

`/oper/ip/bgp`
Operations-Level BGP Options

```
[Border Gateway Protocol Operations Menu]
     start   - Start peer session
     stop    - Stop peer session
     current - Current BGP operational state
```

Table 286 Operations-Level BGP Options

Command Syntax and Usage

start *<peer number (1-16)>*

Starts the peer session.

stop *<peer number (1-16)>*

Stops the peer session.

cur

Displays the current BGP operational state.

/oper/sys
System Operations

```
[Operational System Menu]
     i2c      - System I2C
```

I2C device commands are to be used only by Technical Support personnel.

/oper/virt
Virtualization Operations

```
[Virtualization Operations Menu]
     vmware   - VMware Operations Menu
```

Table 287 describes general virtualization operations options. More details are available in the following sections.

Table 287   Virtualization Options (/oper/virt)

Command Syntax and Usage

vmware

Displays the VMware operations menu.

/oper/virt/vmware
VMware Operations

```
[VMware Operations Menu]
     addpg    - Add a port group to a Host
     addvsw   - Add a Vswitch to a Host
     delpg    - Delete a port group from a Host
     delvsw   - Delete a Vswitch from a Host
     export   - Create or update a VM profile on one or more Hosts
     scan     - Perform a VM Agent scan operation now
     vmacpg   - Change a VM NIC's port group
     updpg    - Update a port group on a Host
```

Use these commands to perform minor adjustments to the VMware operation. Use these commands to perform Virtual Switch operations directly from the switch. Note that these commands require the configuration of Virtual Center access information (**/cfg/virt/vmware/vcspec**).

Table 288   VMware Operations (/oper/virt/vmware)

Command Syntax and Usage

addpg **[**<*Port Group name*> <*host ID*> <*Vswitch name*> <*VLAN number*>
<*shaping-enabled*> <*average-Kbps*> <*burst-KB*> <*peak-Kbps*>**]**

Adds a Port Group to a VMware host. You are prompted for the following information:

- □ Port Group name
- □ VMware host ID (Use host UUID, host IP address, or host name.)
- □ Virtual Switch name
- □ VLAN ID of the Port Group
- □ Whether to enable the traffic-shaping profile (y or n). If you choose y (yes), you are
   prompted to enter the traffic shaping parameters.

addvsw <*host ID*> <*Virtual Switch name*>

Adds a Virtual Switch to a VMware host. Use one of the following identifiers to specify the
host:

- □ UUID
- □ IP address
- □ Host name

delpg <*Port Group name*> <*host ID*>

Removes a Port Group from a VMware host. Use one of the following identifiers to specify
the host:

- □ UUID
- □ IP address
- □ Host name

delvsw <*host ID*> <*Virtual Switch name*>

Removes a Virtual Switch from a VMware host. Use one of the following identifiers to
specify the host:

- □ UUID
- □ IP address
- □ Host name

Table 288 VMware Operations (/oper/virt/vmware) (continued)

Command Syntax and Usage

export *<VM profile name> <VMware host ID (one per line, 'null' to end)>*
 <Virtual Switch name>

Exports a VM Profile to one or more VMware hosts. This command allows you to distribute
a VM Profile to VMware hosts.

Use one of the following identifiers to specify each host:

□ UUID
□ IP address
□ Host name

The switch displays a list of available Virtual Switches. You may enter a VSwitch name from
the list, or enter a new name to create a new Virtual Switch.

scan

Performs a scan of the VM Agent, and updates VM information.

vmacpg *<MAC address> <Port Group name>*

Changes a VM NIC's configured Port Group.

updpg *<Port Group name> <host ID> <VLAN number>* **[** *<shaping enabled>*
 <average (1-100000000)> <burst (1-100000000)> <peak (1-100000000)> **]**

Updates a VMware host's Port Group parameters. Use one of the following identifiers for the
host ID:

□ UUID
□ IP address
□ Host name

Enter the traffic shaping parameters as follows:

□ Shaping enabled
□ Average traffic, in Kilobits per second
□ Maximum burst size, in Kilobytes
□ Peak traffic, in Kilobits per second
□ Delete traffic shaping parameters.

CHAPTER 8
The Boot Options Menu

To use the Boot Options Menu, you must be logged in to the switch as the administrator. The Boot Options menu provides options for:

- Selecting a switch software image to be used when the switch is next reset
- Selecting a configuration block to be used when the switch is next reset
- Downloading or uploading a new software image to the switch via FTP/TFTP

In addition to the Boot Options menu, you can use a Web browser or SNMP to work with switch image and configuration files. To use SNMP, refer to "Switch Images and Configuration Files" on page 455.

/boot
Boot Options

```
[Boot Options Menu]
      stack   - Stacking Menu
      sched   - Scheduled Switch Reset Menu
      image   - Select software image to use on next boot
      conf    - Select config block to use on next boot
      netboot - NetBoot and NetConfig menu
      mode    - Select CLI mode to use on next boot
      prompt  - Prompt for selectable boot mode
      gtimg   - Download new software image via TFTP
      ptimg   - Upload selected software image via TFTP
      reset   - Reset switch [WARNING: Restarts Spanning Tree]
      cur     - Display current boot options
```

Each of these options is discussed in greater detail in the following sections.

`/boot/stack`
Stacking Menu

```
[Boot Stacking Menu]
     mode    - Set the stacking mode for the switch
     stktrnk - Set external 10G ports for Stack Trunks
     vlan    - Set VLAN number for control communication
     clear   - Set stacking parameters to factory default
     pushimg - Push image to a switch in the stack
     ena     - Enable the stacking mode
     dis     - Disable the stacking mode
     cur     - Display current stacking boot parameters
```

The Stacking Boot menu is used to define the role of the switch in a stack: either as the Master that controls the stack, or as a participating Member switch. Options are available for loading stack software to individual Member switches, and to configure the VLAN that is reserved for inter-switch stacking communications.

You must enable Stacking and reset the switch to enter Stacking mode. When the switch enters Stacking mode, the Stacking configuration menu appears. For more information, see "Stacking Configuration Menu" on page 296.

Table 289   Boot Stacking Options (/boot/stack)

Command Syntax and Usage

`mode master|member`

Configures the Stacking mode for the selected switch.

`stktrnk` *<list of ports>*

Configures the ports used to connect the switch to the stack. Enter only 10Gb external ports (48-52).

`vlan` *<VLAN number>*

Configures the VLAN used for Stacking control communication.

`clear`

Resets the Stacking boot parameters to their default values.

`pushimg image1|image2|boot`

Pushes the selected software file from the master to the selected switch.

`ena`

Enables the switch stack.

Table 289   Boot Stacking Options (/boot/stack)

Command Syntax and Usage

dis

Disables the switch stack.

cur

Displays current Stacking boot parameters.

When in stacking mode, the following stand-alone features are not supported:

- Active Multi-Path Protocol (AMP)
- SFD
- sFlow port monitoring
- Uni-Directional Link Detection (UDLD)
- Port flood blocking
- BCM rate control
- Link Layer Detection Protocol (LLDP)
- Private VLANs
- RIP
- OSPF and OSPFv3
- IPv6
- Virtual Router Redundancy Protocol (VRRP)
- Loopback Interfaces
- Router IDs
- Route maps
- Border Gateway Protocol (BGP)
- MAC address notification
- Static MAC address adding
- Static multicast
- Static routes
- MSTP and RSTP settings for CIST, Name, Rev, and Maxhop
- IGMP Relay and IGMPv3
- Virtual NICs

Switch menus and commands for unsupported features may be unavailable, or may have no effect on switch operation.

/boot/sched
Scheduled Reboot Menu

```
[Boot Schedule Menu]
    set     - Set switch reset time
    cancel  - Cancel pending switch reset
    cur     - Display current switch reset schedule
```

This feature allows you to schedule a reboot to occur at a particular time in the future. This feature is particularly helpful if the user needs to perform switch upgrades during off-peak hours. You can set the reboot time, cancel a previously scheduled reboot, and check the time of the currently set reboot schedule.

Table 290   Boot Scheduling Options (/boot/sched)

Command Syntax and Usage

set

   Defines the reboot schedule. Follow the prompts to configure schedule options.

cancel

   Cancels the next pending scheduled reboot.

cur

   Displays the current reboot scheduling parameters.

/boot/netboot
Netboot Configuration Menu

```
[Netboot configuration Menu]
     ena      - Enable netconfig
     dis      - Disable netconfig
     tftpaddr - TFTP Server IP address
     cfgfile  - Location of config file on tftp server
     cur      - Display current configuration
```

Netboot allows the switch to automatically download its configuration file over the network during switch reboot, and apply the new configuration. Upon reboot, the switch includes the following options in its DHCP requests:

■ Option 66 (TFTP server address)

■ Option 67 (file path)

If the DHCP server returns the information, the switch initiates a TFTP file transfer, and loads the configuration file into the active configuration block. As the switch boots up, it applies the new configuration file. Note that the option 66 TFTP server address must be specified in IP-address format (host name is not supported).

If DHCP is not enabled, or the DHCP server does not return the required information, the switch uses the manually-configured TFTP server address and file path.

Table 291   Netboot Options (/boot/netboot)

Command Syntax and Usage

ena

Enables Netboot. When enabled, the switch boots into factory-default configuration, and attempts to download a new configuration file.

dis

Disables Netboot.

tftpaddr *<IP address>*

Configures the IP address of the TFTP server used for manual configuration. This server is used if DHCP is not enabled, or if the DHCP server does not return the required information.

Table 291   Netboot Options (/boot/netboot)

Command Syntax and Usage

cfgfile *<1-31 characters>*

Defines the file path for the configuration file on the TFTP server. For example:

`/directory/sub/config.cfg`

cur

Displays the current Netboot parameters.

Updating the Switch Software Image

The switch software image is the executable code running on the RackSwitch G8000. A version of the image ships with the switch, and comes pre-installed on the device. As new versions of the image are released, you can upgrade the software running on your switch.

On the support site, click on **software updates**. On the switch, use the `/boot/cur` command to determine the current software version.

The typical upgrade process for the software image consists of the following steps:

■ Place the new image onto a FTP or TFTP server on your network, or on a local computer.

■ Transfer the new image to your switch.

■ Select the new software image to be loaded into switch memory the next time the switch is reset.

Loading New Software to Your Switch

The switch can store up to two different software images, called `image1` and `image2`, as well as boot software, called `boot`. When you load new software, you must specify where it should be placed: either into `image1`, `image2`, or `boot`.

For example, if your active image is currently loaded into `image1`, you would probably load the new image software into `image2`. This lets you test the new software and reload the original active image (stored in `image1`), if needed.

To load a new software image to your switch, you need the following:

■ The image or boot software loaded on a FTP/TFTP server on your network

■ The hostname or IPv4/IPv6 address of the FTP/TFTP server

■ The name of the new software image or boot file

Note – The DNS parameters must be configured if specifying hostnames. See "Domain Name System Configuration" on page 404.

When the above requirements are met, use the following procedure to download the new software to your switch.

1. At the `Boot Options#` prompt, enter:

```
Boot Options# gtimg
```

2. Enter the name of the switch software to be replaced:

```
Enter name of switch software image to be replaced
  ["image1"/"image2"/"boot"]: <image>
```

3. Enter the hostname or IPv4/IPv6 address of the FTP or TFTP server.

```
Enter hostname or IP address of FTP/TFTP server: <name or IP address>
```

4. Enter the name of the new software file on the server.

```
Enter name of file on FTP/TFTP server: <filename>
```

   The exact form of the name will vary by server. However, the file location is normally relative to the FTP or TFTP directory (usually `/tftpboot`).

5. Enter your username for the server, if applicable.

```
Enter username for FTP server or hit return for TFTP server: <username>
or <Enter>
```

6. The system prompts you to confirm your request.

   You should next select a software image to run, as described below.

Selecting a Software Image to Run

You can select which software image (`image1` or `image2`) you want to run in switch memory for the next reboot.

1. At the `Boot Options#` prompt, enter:

```
Boot Options# image
```

2. Enter the name of the image you want the switch to use upon the next boot.

   The system informs you of which image is currently set to be loaded at the next reset, and prompts you to enter a new choice:

```
Currently set to use switch software "image1" on next reset.
Specify new image to use on next reset ["image1"/"image2"]:
```

Uploading a Software Image from Your Switch

You can upload a software image from the switch to a FTP or TFTP server.

1. At the `Boot Options#` prompt, enter:

```
Boot Options# ptimg
```

2. The system prompts you for information. Enter the desired image:

```
Enter name of switch software image to be uploaded
["image1"|"image2"|"boot"]: <image>
```

3. Enter the name or the IPv4/IPv6 address of the FTP or TFTP server:

```
Enter hostname or IP address of FTP/TFTP server: <name or IP address>
```

4. Enter the name of the file into which the image will be uploaded on the FTP or TFTP server:

```
Enter name of file on FTP/TFTP server: <filename>
```

5. The system then requests confirmation of what you have entered. To have the file uploaded, enter **Y**.

```
image2 currently contains Software Version 6.5
 that was downloaded at 0:23:39 Thu Jan  4, 2010.
Upload will transfer image2 (2788535 bytes) to file "image1"
 on FTP/TFTP server 192.1.1.1.
Confirm upload operation (y/n) ? y
```

Selecting a Configuration Block

When you make configuration changes to the G8000, you must save the changes so that they are retained beyond the next time the switch is reset. When you perform the save command, your new configuration changes are placed in the *active* configuration block. The previous configuration is copied into the *backup* configuration block.

There is also a *factory* configuration block. This holds the default configuration set by the factory when your G8000 was manufactured. Under certain circumstances, it may be desirable to reset the switch configuration to the default. This can be useful when a custom-configured G8000 is moved to a network environment where it will be re-configured for a different purpose.

Use the following procedure to set which configuration block you want the switch to load the next time it is reset:

1. At the Boot Options# prompt, enter:

```
Boot Options# conf
```

2. Enter the name of the configuration block you want the switch to use:

The system informs you of which configuration block is currently set to be loaded at the next reset, and prompts you to enter a new choice:

```
Currently set to use active configuration block on next reset.
Specify new block to use ["active"/"backup"/"factory"]:
```

Resetting the Switch

You can reset the switch to make your software image file and configuration block changes occur.

Note – Resetting the switch causes the Spanning Tree Group to restart. This process can be lengthy, depending on the topology of your network.

To reset the switch, at the `Boot Options#` prompt, enter:

```
>> Boot Options# reset
```

You are prompted to confirm your request.

Accessing the ISCLI

The default command-line interface for the G8000 is the ISCLI. To access the ISCLI, enter the following command and reset the G8000:

```
Main# boot/mode iscli
```

To access the BLADEOS CLI, enter the following command from the ISCLI and reload the G8000:

```
Switch (config)# boot cli-mode bladeos-cli
```

Users can select the CLI mode upon login, if the /boot/prompt command is enabled. Only an administrator can view and enable /boot/prompt. When /boot/prompt is enabled, the first user to log in can select the CLI mode. Subsequent users must use the selected CLI mode, until all users have logged out.

Using the Boot Management Menu

The Boot Management menu allows you to switch the software image, reset the switch to factory defaults, or to recover from a failed software download.

You can interrupt the boot process and enter the Boot Management menu from the serial console port. When the system displays Memory Test, press <Shift B>. The Boot Management menu appears.

```
Resetting the System ...
Memory Test .............................

Boot Management Menu
1 - Change booting image
2 - Change configuration block
3 - Xmodem download
4 - Exit

Please choose your menu option: 1
Current boot image is 1. Enter image to boot: 1 or 2: 2
Booting from image 2
```

The Boot Management menu allows you to perform the following actions:

- To change the booting image, press 1 and follow the screen prompts.

- To change the configuration block, press 2, and follow the screen prompts.

- To perform an Xmodem download, press 3 and follow the screen prompts.

- To exit the Boot Management menu, press 4. The booting process continues.

Recovering from a Failed Upgrade

Use the following procedure to recover from a failed software upgrade.

1. Connect a PC to the serial port of the switch.

2. Open a terminal emulator program that supports XModem Download (for example, HyperTerminal, CRT, PuTTY) and select the following serial port characteristics:

- Speed: 9600 bps
- Data Bits: 8
- Stop Bits: 1
- Parity: None
- Flow Control: None

3. Boot the switch and access the Boot Management menu by pressing <Shift B> while the Memory Test is in progress and the dots are being displayed.

4. Select 3 for Xmodem download. When you see the following message, change the Serial Port characteristics to 115200 bps:

```
## Switch baudrate to 115200 bps and press ENTER ...
```

5. Press <Enter> to set the system into download accept mode. When the readiness meter displays (a series of "C" characters), start XModem on your terminal emulator.

6. Select the Boot Image to download. The XModem initiates the file transfer. When the download is complete, a message similar to the following is displayed:

```
yzModem - CRC mode, 62494(SOH)/0(STX)/0(CAN) packets, 6 retries

Extracting images ... Do *NOT* power cycle the switch.

**** VMLINUX ****

Un-Protected 10 sectors

Erasing Flash............ done

Writing to Flash............done

Protected 10 sectors

**** RAMDISK ****

Un-Protected 44 sectors

Erasing Flash.......................................... done

Writing to Flash........................................done

Protected 44 sectors

**** BOOT CODE ****

Un-Protected 8 sectors

Erasing Flash.......... done

Writing to Flash..........done

Protected 8 sectors
```

7. When you see the following message, change the Serial Port characteristics to 9600 bps:

```
## Switch baudrate to 9600 bps and press ESC ...
```

8. Press the Escape key (<Esc>) to re-display the Boot Management menu.

9. Select 3 to start a new XModem Download. When you see the following message, change the Serial Port characteristics to 115200 bps:

```
## Switch baudrate to 115200 bps and press ENTER ...
```

10. Press <Enter> to continue the download.

11. Select the OS Image to download. The XModem initiates the file transfer. When the download is complete, a message similar to the following is displayed:

```
yzModem - CRC mode, 27186(SOH)/0(STX)/0(CAN) packets, 6 retries

Extracting images ... Do *NOT* power cycle the switch.

**** Switch OS ****


Please choose the Switch OS Image to upgrade [1|2|n] :
```

12. Select the image number to load the new image (1 or 2). It is recommended that you select 1. A message similar to the following is displayed:

```
Switch OS Image 1 ...

Un-Protected 27 sectors

Erasing Flash............................ done

Writing to Flash...........................done

Protected 27 sectors
```

13. When you see the following message, change the Serial Port characteristics to 9600 bps:

```
## Switch baudrate to 9600 bps and press ESC ...
```

14. Press the Escape key (<Esc>) to re-display the Boot Management menu.

15. Select 4 to exit and boot the new image.

CHAPTER 9
The Maintenance Menu

The Maintenance menu is used to manage dump information and forward database information. It also includes a debugging menu to help with troubleshooting.

/maint
Maintenance Menu

Note – To use the Maintenance menu, you must be logged in to the switch as the administrator.

```
[Maintenance Menu]
    sys      - System Maintenance Menu
    fdb      - Forwarding Database Manipulation Menu
    debug    - Debugging Menu
    lldp     - LLDP Cache Manipulation Menu
    arp      - ARP Cache Manipulation Menu
    route    - IP Route Manipulation Menu
    igmp     - IGMP Multicast Group Menu
    nbrcache - IP6 NBR Cache Manipulation Menu
    route6   - IP6 Route Manipulation Menu
    uudmp    - Uuencode FLASH dump
    ptdmp    - Upload FLASH dump via FTP/TFTP
    ptlog    - Upload file via TFTP
    cldmp    - Clear FLASH dump
    tsdmp    - Tech support dump
    pttsdmp  - Upload tech support dump via FTP/TFTP
```

Dump information contains internal switch state data that is written to flash memory on the RackSwitch G8000 after any one of the following occurs:

■ The watchdog timer forces a switch reset. The purpose of the watchdog timer is to reboot the switch if the switch software freezes.

■ The switch detects a hardware or software problem that requires a reboot.

Table 292   Maintenance Menu Options

Command Syntax and Usage

sys

   Displays the System Maintenance menu. To view menu options, see page 485.

fdb

   Displays the Forwarding Database Manipulation menu. To view menu options, see page 486.

debug

   Displays the Debugging menu. To view menu options, see page 487.

lldp

   Displays the LLDP Cache Manipulation menu. To view menu options, see page 488.

arp

   Displays the ARP Cache Manipulation menu. To view menu options, see page 489.

route

   Displays the IP Route Manipulation menu. To view menu options, see page 490.

igmp

   Displays the IGMP Maintenance menu. To view menu options, see page 491.

nbrcache

   Displays the IPv6 Neighbor Cache Manipulation menu. To view menu options, see page 494.

route6

   Displays the IPv6 Route Manipulation menu. To view menu options, see page 495.

uudmp

   Displays dump information in uuencoded format. For details, see page 496.

ptdmp *<host name>*   *<file name>*

   Saves the system dump information via TFTP. For details, see page 496.

ptlog

   Saves the system log file (SYSLOG) via TFTP.

Table 292   Maintenance Menu Options

Command Syntax and Usage

cldmp

Clears dump information from flash memory. For details, see page 497.

tsdmp

Dumps all G8000 information, statistics, and configuration. You can log the tsdump output into a file.

pttsdmp

Redirects the technical support dump (tsdmp) to an external TFTP server.

/maint/sys
System Maintenance

This menu is reserved for use by Technical Support personnel. The options are used to perform system debugging.

```
[System Maintenance Menu]
      flags   - Set NVRAM flag word
      tmask   - Set MP trace mask word
```

Table 293   System Maintenance Options

Command Syntax and Usage

flags   *<new NVRAM flags word as 0xXXXXXXXX>*

This command sets the flags that are used for debugging purposes by Technical Support personnel.

tmask   *<new trace mask word as 0xXXXXXXXX>*   [**p**]

This command sets the trace mask that is used for debugging purposes by Technical Support personnel.

`/maint/fdb`
Forwarding Database Maintenance

```
[FDB Manipulation Menu]
     find     - Show a single FDB entry by MAC address
     port     - Show FDB entries for a single port
     vlan     - Show FDB entries for a single VLAN
     dump     - Show all FDB entries
     del      - Delete an FDB entry
     clear    - Clear entire FDB
     mcdump   - Display all Multicast MAC entries added
     mcreload - Reload all Multicast MAC entries
```

The Forwarding Database Manipulation menu can be used to view information and to delete a MAC address from the forwarding database or clear the entire forwarding database. This is helpful in identifying problems associated with MAC address learning and packet forwarding decisions.

Table 294   FDB Manipulation Options

Command Syntax and Usage

find *<MAC address>* [*<VLAN number>*]

Displays a single database entry by its MAC address. You are prompted to enter the MAC address of the device. Enter the MAC address using one of the following formats:

☐   xx:xx:xx:xx:xx:xx (such as 08:00:20:12:34:56)

☐   xxxxxxxxxxxx (such as 080020123456)

port *<port alias or number>*

Displays all FDB entries for a particular port.

vlan *<VLAN number>*

Displays all FDB entries on a single VLAN.

dump

Displays all entries in the Forwarding Database. For details, see page 71.

del *<MAC address>* [*<VLAN number>*]

Removes a single FDB entry.

clear

Clears the entire Forwarding Database from switch memory.

Table 294 FDB Manipulation Options

Command Syntax and Usage

mcdump

Displays all Multicast MAC entries in the FDB.

mcreload

Reloads static Multicast MAC entries.

/maint/debug
Debugging

```
[Miscellaneous Debug Menu]
    tbuf    - Show MP trace buffer
    snap    - Show MP snap (or post-mortem) trace buffer
    clrcfg  - Clear all flash configs
```

The Miscellaneous Debug menu displays trace buffer information about events that can be helpful in understanding switch operation. You can view the following information using the debug menu:

■ Events traced by the Management Processor (MP)
■ Events traced to a buffer area when a reset occurs

If the switch resets for any reason, the MP trace buffer is saved into the snap trace buffer area. The output from these commands can be interpreted by Technical Support personnel.

Table 295 Miscellaneous Debug Options

Command Syntax and Usage

tbuf

Displays the Management Processor trace buffer. Header information similar to the following is shown:

```
MP trace buffer at 13:28:15 Fri May 30, 2008; mask: 0x2ffdf748
```

The buffer information is displayed after the header.

snap

Displays the Management Processor snap (or post-mortem) trace buffer. This buffer contains information traced at the time that a reset occurred.

clrcfg

Deletes all flash configuration blocks.

/maint/lldp
LLDP Cache Manipulation

```
[LLDP Menu]
     port    - Show LLDP port information
     rx      - Show LLDP receive state machine information
     tx      - Show LLDP transmit state machine information
     remodev - Show LLDP remote devices information
     dump    - Show all LLDP information
     clear   - Clear LLDP remote devices information
```

Table 301 describes the LLDP cache manipulation commands.

Table 296 LLDP Cache Manipulation Options

Command Syntax and Usage

port *<port alias or number>*

Displays Link Layer Discovery Protocol (LLDP) port information.

rx

Displays information about the LLDP receive state machine.

tx

Displays information about the LLDP transmit state machine.

remodev *<1-256>*

Displays information received from LLDP -capable devices.

dump

Displays all LLDP information.

clear

Clears the LLDP cache.

/maint/arp
ARP Cache Maintenance

```
[Address Resolution Protocol Menu]
     find     - Show a single ARP entry by IP address
     port     - Show ARP entries on a single port
     vlan     - Show ARP entries on a single VLAN
     addr     - Show ARP entries for switch's interfaces
     dump     - Show all ARP entries
     clear    - Clear ARP cache
```

Table 297 ARP Maintenance Options

Command Syntax and Usage

find *<IP address (such as, 192.4.17.101)>*

Shows a single ARP entry by IP address.

port *<port alias or number>*

Shows ARP entries on a single port.

vlan *<VLAN number>*

Shows ARP entries on a single VLAN.

addr

Shows the list of IP addresses which the switch will respond to for ARP requests.

dump

Shows all ARP entries.

clear

Clears the entire ARP list from switch memory.

Note – To display all ARP entries currently held in the switch, or a portion according to one of the options listed on the menu above (find, port, vlan, dump), you can also refer to "ARP Information" on .

/maint/route
IP Route Manipulation

```
[IP Routing Menu]
        find  - Show a single route by destination IP address
        gw    - Show routes to a single gateway
        type  - Show routes of a single type
        tag   - Show routes of a single tag
        if    - Show routes on a single interface
        dump  - Show all routes
        clear - Clear route table
```

Table 298   IP Route Manipulation Options

Command Syntax and Usage

find *<IP address (such as, 192.4.17.101)>*

Shows a single route by destination IP address.

gw *<default gateway address (such as, 192.4.17.44)>*

Shows routes to a default gateway.

type indirect|**direct**|**local**|**broadcast**|**martian**|**multicast**

Shows routes of a single type. For a description of IP routing types, see Table 33 on page 95

tag fixed|**static**|**addr**|**rip**|**ospf**|**bgp**|**broadcast**|**martian**|**multicast**

Shows routes of a single tag. For a description of IP routing tags, see Table 34 on page 96

if *<interface number>*

Shows routes on a single interface.

dump

Shows all routes.

clear

Clears the route table from switch memory.

Note – To display all routes, you can also refer to "IP Routing Information" on page 94.

/maint/igmp
IGMP Maintenance

```
[IGMP Multicast Group Menu]
     group    - Multicast Group Menu
     mrouter  - IGMP Multicast Router Port Menu
     clear    - Clear group and mrouter tables
```

Table 299 describes the IGMP Maintenance commands.

Table 299 IGMP Maintenance Options

Command Syntax and Usage

group

Displays the Multicast Group menu. To view menu options, see page 492.

mrouter

Displays the Multicast Router Port menu. To view menu options, see page 491.

clear

Clears the IGMP group table and Mrouter tables.

/maint/igmp/group
IGMP Group Maintenance

```
[IGMP Multicast Group Menu]
     find    - Show a single group by IP group address
     vlan    - Show groups on a single vlan
     port    - Show groups on a single port
     trunk   - Show groups on a single trunk
     detail  - Show detail of a single group by IP address
     dump    - Show all groups
     clear   - Clear group tables
```

Table 299 describes the IGMP Maintenance commands.

Table 300 IGMP Multicast Group Maintenance Options

Command Syntax and Usage

find *<IP address>*

Displays a single IGMP multicast group by its IP address.

vlan *<VLAN number>*

Displays all IGMP multicast groups on a single VLAN.

port *<port number or alias>*

Displays all IGMP multicast groups on a single port.

trunk *<trunk number>*

Displays all IGMP multicast groups on a single trunk group.

detail *<IP address>*

Displays detailed information about a single IGMP multicast group.

dump

Displays information for all multicast groups.

clear

Clears the IGMP group tables.

/maint/igmp/mrouter
IGMP Multicast Routers Maintenance

```
[IGMP Multicast Routers Menu]
     vlan    - Show all multicast router ports on a single vlan
     dump    - Show all multicast router ports
     clear   - Clear multicast router port table
```

Table 301 describes the IGMP multicast router (Mrouter) maintenance commands.

Table 301   IGMP Mrouter Maintenance Options

Command Syntax and Usage

vlan *<VLAN number>*

Shows all IGMP multicast router ports on a single VLAN.

dump

Shows all multicast router ports.

clear

Clears the IGMP Multicast Router port table.

/maint/nbrcache
IPv6 Neighbor Discovery Cache Manipulation

```
[Neighbor Cache Manipulation Menu]
     find     - Show a single NBR Cache entry by IP address
     port     - Show NBR Cache entries on a single port
     vlan     - Show NBR Cache entries on a single VLAN
     dump     - Show all NBR Cache entries
     clear    - Clear neighbor cache
```

Table 302 describes the IPv6 Neighbor Discovery cache manipulation options.

Table 302 IPv6 Neighbor Discovery Cache Manipulation

Command Syntax and Usage

find *<IPv6 address>*

Shows a single IPv6 Neighbor Discovery cache entry by IP address.

port *<port alias or number>*

Shows IPv6 Neighbor Discovery cache entries on a single port.

vlan *<VLAN number>*

Shows IPv6 Neighbor Discovery cache entries on a single VLAN.

dump

Shows all IPv6 Neighbor Discovery cache entries.

clear

Clears all IPv6 Neighbor Discovery cache entries from switch memory.

/maint/route6
IPv6 Route Manipulation

```
[IP6 Routing Menu]
     dump     - Show all routes
     clear    - Clear route table
```

Table 303 describes the IPv6 Route maintenance options.

Table 303   IPv6 Route Manipulation Options

Command Syntax and Usage

dump

Shows all IPv6 routes.

clear

Clears all IPv6 routes from switch memory.

/maint/uudmp
Uuencode Flash Dump

Using this command, dump information is presented in uuencoded format. This format makes it easy to capture the dump information as a file or a string of characters.

If you want to capture dump information to a file, set your communication software on your workstation to capture session data prior to issuing the uudmp command. This will ensure that you do not lose any information. Once entered, the uudmp command will cause approximately 23,300 lines of data to be displayed on your screen and copied into the file.

Using the uudmp command, dump information can be read multiple times. The command does not cause the information to be updated or cleared from flash memory.

Note – Dump information is not cleared automatically. In order for any subsequent dump information to be written to flash memory, you must manually clear the dump region. For more information on clearing the dump region, see page 497.

To access dump information, at the Maintenance# prompt, enter:

```
Maintenance# uudmp
```

The dump information is displayed on your screen and, if you have configured your communication software to do so, captured to a file. If the dump region is empty, the following appears:

```
No FLASH dump available.
```

/maint/ptdmp *<FTP/TFTP server>* *<filename>*
FTP/TFTP System Dump Put

Use this command to put (save) the system dump to a FTP/TFTP server.

Note – If the FTP/TFTP server is running SunOS or the Solaris operating system, the specified ptdmp file must exist *prior* to executing the ptdmp command, and must be writable (set with proper permission, and not locked by any application). The contents of the specified file will be replaced with the current dump data.

To save dump information via FTP/TFTP, at the Maintenance# prompt, enter:

```
Maintenance# ptdmp <FTP/TFTP server> <filename>
```

Where *server* is the FTP/TFTP server IPv4/IPv6 address or hostname, and *filename* is the target dump file.

Clearing Dump Information

To clear dump information from flash memory, at the `Maintenance#` prompt, enter:

```
Maintenance# cldmp
```

The switch clears the dump region of flash memory and displays the following message:

```
FLASH dump region cleared.
```

If the flash dump region is already clear, the switch displays the following message:

```
FLASH dump region is already clear.
```

Unscheduled System Dumps

If there is an unscheduled system dump to flash memory, the following message is displayed when you log on to the switch:

```
Note: A system dump exists in FLASH. The dump was saved
      at 13:43:22 Wednesday January 30, 2010. Use /maint/uudmp to
      extract the dump for analysis and /maint/cldmp to
      clear the FLASH region. The region must be cleared
      before another dump can be saved.
```

BLADEOS System Log Messages

The RackSwitch G8000 (G8000) uses the following syntax when outputting system log (syslog) messages:

> *<Time stamp><Log Label>*BLADEOS*<Thread ID>*:*<Message>*

The following parameters are used:

■ *<Timestamp>*

The time of the message event is displayed in the following format:

> *<month (3 characters)>* *<day>* *<hour (1-24)>*:*<minute>*:*<second>*

For example: Aug 19 14:20:30

■ *<Log Label>*

The following types of log messages are recorded: LOG_CRIT, LOG_WARNING, LOG_ALERT, LOG_ERR, LOG_NOTICE, and LOG_INFO

■ *<Thread ID>*

This is the software thread that reports the log message. For example: stg, ip, console, telnet, vrrp, system, web server, ssh, bgp

■ *<Message>*: The log message

Following is a list of potential syslog messages. To keep this list as short as possible, only the *<Thread ID>* and *<Message>* are shown. The messages are sorted by *<Log Label>*.

Where the *<Thread ID>* is listed as mgmt, one of the following may be shown: console, telnet, web server, or ssh.

LOG_ALERT

Thread	LOG_ALERT Message
	Possible buffer overrun attack detected!
AMP	Putting port *<port>* in blocking state
BGP	Invalid notification (Code:*<code>*, Subcode:*<subcode>*) received from *<IP address>*
BGP	session with *<IP address>* failed (bad event:*<event>*)
BGP	session with *<IP address>* failed *<reason>*

Reasons:

- Connect Retry Expire
- Holdtime Expire
- Invalid
- Keepalive Expire
- Receive KEEPALIVE
- Receive NOTIFICATION
- Receive OPEN
- Receive UPDATE
- Start
- Stop
- Transport Conn Closed
- Transport Conn Failed
- Transport Conn Open
- Transport Fatal Error

Thread	LOG_ALERT Message (continued)
BGP	session with *<IP address>* failed *<reason type>* : *<reason>*

Reason Types:

- FSM Error
- Hold Timer Expired
- Message Header Error
- OPEN Message Error
- UPDATE Message Error

Reasons:

- AS Routing Loop
- Attr Flags Error
- Attr Length Error
- Auth Failure
- Bad BGP Identifier
- Bad HoldTime
- Bad Length
- Bad Peer AS
- Bad Type
- Conn Not Synced
- Invalid Network Field
- Invalid NEXTHOP Attr
- Invalid ORIGIN Attr
- Malformed AS_PATH
- Malformed Attr List
- Missing Well Known Attr
- None
- Optional Attr Error
- Unrecognized Well Known Attr
- Unsupported Opt Param
- Unsupported Version

Thread	Message
HOTLINKS	LACP trunk *<trunk ID>* and *<trunk ID>* formed with admin key *<key>*
IP	cannot contact default gateway *<IP address>*
IP	Dynamic Routing table is full
IP	Route table full
MGMT	Maximum number of login failures (*<threshold>*) has been exceeded.
OSPF	Interface IP *<IP address>*, Interface State {Down	Loopback	Waiting	P To P	DR	BackupDR	DR Other}: Interface down detached
OSPF	LS Database full: likely incorrect/missing routes or failed neighbors
OSPF	Neighbor Router ID *<router ID>*, Neighbor State {Down	Attempt	Init	2 Way	ExStart	Exchange	Loading	Full	Loopback	Waiting	P To P	DR	BackupDR	DR Other}
OSPF	OSPF Route table full: likely incorrect/missing routes
RMON	Event.*<description>*

Thread	LOG_ALERT Message (continued)
STP	CIST new root bridge
STP	CIST topology change detected
STP	Fast Forward port *<port>* active, putting port into forwarding state
STP	New preferred Fast Uplink port *<port>* active for STG *<STG>*, {restarting | canceling} timer
STP	own BPDU received from port *<port>*
STP	Port *<port>*, putting port into blocking state
STP	Preferred STG *<STG>* Fast Uplink port has gone down. Putting secondary Fast Uplink port *<port>* into forwarding
STP	Setting STG *<STG>* Fast Uplink primary port *<port>* forwarding and backup port *<port>* blocking
STP	STG *<STG>* preferred Fast Uplink port *<port>* active. Waiting *<seconds>* seconds before switching from port *<port>*
STP	STG *<STG>*, new root bridge
STP	STG *<STG>*, topology change detected
STP	STG *<STG>* root port *<port>* has gone down. Putting backup Fast Uplink port *<port>* into forwarding
SYSTEM	*<SFP type>* inserted at port *<port>* is UNAPPROVED ! Device is DISABLED.
SYSTEM	*<SFP name>* UnApproved - *<SFP type>* is DISABLED
SYSTEM	Ingress PVST+ BPDU's spotted from port *<port>*
SYSTEM	LACP trunk *<trunk ID>* and *<trunk ID>* formed with admin key <key>
VRRP	Received <x> virtual routers instead of <y>
VRRP	received errored advertisement from *<IP address>*
VRRP	received incorrect addresses from *<IP address>*
VRRP	received incorrect advertisement interval <interval> from *<IP address>*
VRRP	received incorrect VRRP authentication type from *<IP address>*
VRRP	received incorrect VRRP password from *<IP address>*
VRRP	VRRP : received incorrect IP addresses list from *<IP address>*

LOG_CRIT

Thread	LOG_CRIT Message
SSH	can't allocate memory in load_MP_INT()
SSH	currently not enough resource for loading RSA {private ǀ public key}
SYSTEM	*<SFP name>* I2C Failure *<SFP type>*
SYSTEM	*<SFP name>* TX Fault - *<SFP type>* is DISABLED
SYSTEM	*<SFP name>* Wrong Transceiver Type *<SFP type>*
SYSTEM	Failed to read SFP/XFP/SFP+ status
SYSTEM	Fan Failure Warning Cleared
SYSTEM	**** MAX TEMPERATURE (*<temperature>*) ABOVE FAIL THRESH ****
SYSTEM	**** MAX TEMPERATURE (*<temperature>*) ABOVE WARN THRESH ****
SYSTEM	**** PLATFORM THERMAL SHUTDOWN ****
SYSTEM	Power Supply Warning Cleared
SYSTEM	System memory is at *<n>* percent
SYSTEM	Temp {back ǀ increased} to {alert ǀ critical ǀ normal ǀ warning} level
SYSTEM	TEMP FAULT DETECTED!
SYSTEM	Warning: Fan Failure
SYSTEM	Warning: Power Supply Disconnected or Failure

LOG_ERR

Thread	LOG_ERR Message
CFG	Can't assign a port with same protocol to different VLANs.
CFG	Configuration file is EMPTY
CFG	Configuration is too large
CFG	Default VLAN cannot be a private-VLAN.
CFG	Error writing active config to FLASH! Configuration is too large
CFG	Error writing active config to FLASH! Unknown error
CFG	ERROR: More than <maximum> VLAN(s) in downstream
CFG	Have not defined protocol type!
CFG	Maximum allowed number (30) of Alarm groups have already been created.
CFG	Maximum allowed number (30) of Event groups have already been created.
CFG	Maximum allowed number (5) of History groups have already been created.
CFG	Need to enable port's tag for tagging pvlan.
CFG	Overflow! Port has more than 16 protocols.
CFG	Port is not for this protocol.
CFG	Switch rem port fails when disable {protocol|vlan}.
CFG	TFTP {Copy|cfgRcv} attempting to redirect a previously redirected output
IP6	EXCEPTIONAL CASE Trying to create IP6 Interface after the Ip6Shutdown
IP6	Ip6SetAddr(failed):if=<*interface*>, rc=<*reason code*>
IP6	IPv6 route table full
IP6	ipv6_add_interface_immediate: Buffer Non Linear for ip6_cfa_params
IP6	ipv6_add_nbrcache_immediate: Buffer Non Linear for ip6_cfa_params
IP6	ipv6_add_prefix_immediate: Buffer Non Linear for ip6_cfa_params
IP6	ipv6_rem_prefix_immediate: Buffer Non Linear for ip6_cfa_params
IP6	ipv6_rem_route_immediate: Buffer Non Linear for ip6_cfa_params
IP6	ipv6_vlan_change_immediate: Buffer Non Linear for ip6_cfa_params

Thread	LOG_ERR Message (continued)
LLDP	Port *<port>*: Cannot add new entry. MSAP database is full!
MGMT	Apply is issued by another user. Try later
MGMT	Critical Error. Failed to add Interface *<interface>*
MGMT	Critical Error. Failed to {add ׀ attach} Loopback Interface *<interface>*
MGMT	Critical Erro. Failed to detach Loopback Interface *<interface>* rc=*<reason code>*
MGMT	Diff is issued by another user. Try later
MGMT	Dump is issued by another user. Try later
MGMT	Error: Apply not done
MGMT	Error: Pushed {image1 ׀ image2} size *<bytes>* bigger than the capacity *<maximum bytes>*.
MGMT	Error: Invalid {image1 ׀ image2}
MGMT	Error: Pushed {image1 ׀ image2} size *<bytes>* bigger than the capacity *<maximum bytes>*.
MGMT	Error: Save not done.
MGMT	Firmware download failed (insufficient memory
MGMT	Invalide CRC value. Boot image rejected
MGMT	Revert Apply is issued by another user. Try later
MGMT	Revert is issued by another user. Try later.
MGMT	Save is issued by another user. Try later
MGT	You are attempting to load an image that has been corrupted or belongs to another switch type. Please verify you have the correct file for this switch and try again. [Error: Invalid header magic value <value>.] Boot image rejected
NTP	unable to listen to NTP port
RMON	Maximum {Alarm ׀ Event ׀ History} groups exceeded when trying to add group *<group>* via SNMP
STACK	Boot Image could not be successfully received by *<MAC adress>*[. Resending it.]
STACK	Config File could not be successfully received by *<MAC adress>*[. Resending it.]
STACK	File *<File ID>* could not be successfully received by *<MAC adress>*[. Resending it.]

Thread	LOG_ERR Message (continued)
STACK	Image1	2 could not be successfully received by *<MAC adress>*[. Resending it.]
STACK	Incorrect xfer status: from *<MAC adress>* for {Boot Image	Image1	Image2	Config File	File *<File ID>*} status *<status>*
STACK	Switch with duplicate MAC (*<MAC address>*) trying to join.
STACK	The joining of switch (*<MAC address>*) with different chassis type *<chassis type>* is denied
STACK	The joining of switch (*<MAC address>*) with different type *<switch type>* is denied
STACK	The master has different chassis type *<chassis type>*
STP	Cannot set "{Hello Time	Max Age	Forward Delay	Aging}" (Switch is in MSTP mode)
SYSTEM	Error: BOOTP Offer was found incompatible with the other IP interfaces
SYSTEM	Error: DHCP Offer was found invalid by ip configuration checking; please see system log for details.
SYSTEM	I2C device *<ID>* *<description>* set to access state *<state>* [from CLI]
SYSTEM	Not enough memory!
SYSTEM	{PortChannel	Trunk group} creation failed for {IntPortChannel	PortChannel	Internal Trunk group	Trunk group} *<trunk ID>*. Only *<maximum trunks>* {PortChannels	Trunk groups} supported by hardware.
TFTP	Error: Receive file from the master failed for *<file ID>*.
TFTP	Error: Receive transfer of config file from the master failed
TFTP	Error: Receive transfer of image1	2 from the master failed
TFTP	Error: Sending of {boot image	config file	image1	image2	} to switch *<MAC address>* failed
VRRP	Virtual Router Group is disabled due to no enabled virtual routers.

LOG_INFO

Thread	LOG_INFO Message
	System log cleared by user *<username>*.
	System log cleared via SNMP.
HOTLINKS	"Error" is set to "{Active | Standby}"
HOTLINKS	"Learning" is set to "{Active | Standby}"
HOTLINKS	"None" is set to "{Active | Standby}"
HOTLINKS	"Side Max" is set to "{Active | Standby}"
HOTLINKS	has no "{Side Max | None | Learning | Error}" interface
MGMT	/* Config changes at <time> by *<username>* */ *<config diff>* /* Done */
MGMT	*<username>* ejected from BBI
MGMT	*<username>*(*<user type>*) {logout | ejected | idle timeout | connection closed} from {Console | Telnet/SSH}
MGMT	*<username>*(*<user type>*) login {on Console | from host *<IP address>*}
MGMT	Boot image ({Boot | Kernel | FS}, *<size>* bytes) download complete.
MGMT	boot image changed
MGMT	boot kernel download completed. Now writing to flash.
MGMT	boot kernel downloaded {from host *<hostname>* | via browser}, filename too long to be displayed, software version *<version>*
MGMT	boot kernel downloaded from host *<hostname>*, file'*<filename>*', software version *<version>*
MGMT	Boot Sector now contains Software Version *<version>*
MGMT	Can't downgrade to image with only single flash support
MGMT	Could not revert unsaved changes
MGMT	Download already currently in progress. Try again later via {Browser | BBI}
MGMT	Error in setting the new config
MGMT	Failed to allocate buffer for diff track.
MGMT	Failover just occurred, please try later

Thread	LOG_INFO Message (continued)
MGMT	Firmware download failed to {invalid image | image1 | image2 | boot kernel | undefined | SP boot kernel}
MGMT	Firmware downloaded to {invalid image | image1 | image2 | boot kernel | undefined | SP boot kernel}.
MGMT	Flash dump successfully tftp'd to *<hostname>*:*<filename>*
MGMT	FLASH ERROR - invalid address used
MGMT	Flash Read Error. Failed to read flash into holding structure. Quitting
MGMT	Flash Write Error
MGMT	Flash Write Error. Failed to allocate buffer. Quitting
MGMT	Flash Write Error. Trying again
MGMT	Forced unit detach detected, please try later
MGMT	FS Sector now contains Software Version *<version>*
MGMT	image1 | 2 download completed. Now writing to flash.
MGMT	image1 | 2 downloaded {from host *<hostname>* | via browser}, filename too long to be displayed, software version *<version>*
MGMT	image1 | 2 downloaded from host *<hostname>*, file'*<filename>*', software version *<version>*
MGMT	image1 | 2 now contains Software Version *<version>*
MGMT	Incorrect image being loaded
MGMT	Invalid diff track address. Continuing with apply()
MGMT	Invalid image being loaded for this switch type
MGMT	invalid image download completed. Now writing to flash.
MGMT	invalid image downloaded {from host *<hostname>* | via browser}, filename too long to be displayed, software version *<version>*
MGMT	invalid image downloaded from host *<hostname>*, file '*<filename>*', software version *<version>*
MGMT	Kernel Sector now contains Software Version *<version>*
MGMT	NETBOOT: Config successfully downloaded and applied from *<hostname>*:*<filename>*

Thread	LOG_INFO Message (continued)
MGMT	New config set
MGMT	new configuration applied [from BBI | EM | NETBOOT | SCP | SNMP | Stacking Master]
MGMT	new configuration saved from {BBI | BladeOS | ISCLI | SNMP}
MGMT	Please save your current configuration and restart the stack.
MGMT	Revert failed: configuration is dumped or modified by another user.
MGMT	scp<*username*>(<*user type*>) {logout | ejected | idle timeout | connection closed} from {Console | Telnet/SSH}
MGMT	scp<*username*>(<*user type*>) login {on Console | from host <*IP address*>}
MGMT	SP boot kernel download completed. Now writing to flash.
MGMT	SP boot kernel downloaded {from host <*hostname*> | via browser}, filename too long to be displayed, software version <*version*>
MGMT	SP boot kernel downloaded from host <*hostname*>, file '<*filename*>', software version <*version*>
MGMT	Starting Firmware download for {invalid image | image1 | image2 | boot kernel | undefined | SP boot kernel}.
MGMT	Static FDB entry on disabled VLAN
MGMT	Static FDB entry on invalid VLAN
MGMT	Tech support dump failed
MGMT	Tech support dump successfully tftp'd to <*hostname*>:<*filename*>
MGMT	Two Phase Apply Failed in Creating Backup Config Block.
MGMT	undefined download completed. Now writing to flash.
MGMT	undefined downloaded {from host <*hostname*> | via browser}, filename too long to be displayed, software version <*version*>
MGMT	undefined downloaded from host <*hostname*>, file '<*filename*>', software version <*version*>
MGMT	unsaved changes reverted [from BBI | from SNMP]
MGMT	Unsupported GBIC {accepted | refused}
MGMT	user {SNMP user | <*username*>} ejected from BBI

Thread	LOG_INFO Message (continued)
MGMT	Verification of new {invalid image	image1	image2	boot kernel	undefined	SP boot kernel} in FLASH successful.
MGMT	WARNING WARNING WARNING WARNING!!!!!!!!!! CRC Error detected in BOOT region ({Boot | Kernel | FS}) - download another image and DO NOT reset your switch
MGMT	WARNING: A Reboot is required for the new downloaded image to take effect.
MGMT	Watchdog has been {enabled	disabled}
MGMT	Watchdog timeout interval is now *<seconds>* seconds)
MGMT	Writing to flash...This can take up to {90	150} seconds. Please wait
MGMT	Wrong config file type
RMON	RMON {alarm	event	history} index *<ID>* was deleted via SNMP
RMON	SNMP configuration for RMON {alarm	event	history} index *<ID>* applied
SSH	*<username>*(*<user type>*) {logout	ejected	idle timeout	connection closed} from {Console	Telnet/SSH}
SSH	*<username>*(*<user type>*) login {on Console	from host *<IP address>*}
SSH	Error in setting the new config
SSH	New config set
SSH	scp*<username>*(*<user type>*) {logout	ejected	idle timeout	connection closed} from {Console	Telnet/SSH}
SSH	scp*<username>*(*<user type>*) login {on Console	from host *<IP address>*}
SSH	server key autogen {starts	completes}
SSH	Wrong config file type
SYSTEM	booted version *<version>* from Flash image *<image>*, {active	backup	factory} config block
SYSTEM	FDB Learning {DISABLED	ENABLED} for port *<port>*
TFTP	Successfully sent {boot image	image1	mage2} to switch *<MAC adress>*

LOG_NOTICE

Thread	LOG_NOTICE Message
	<minutes> {minute	minutes} until scheduled reboot
	ARP table is full.
	Current config successfully tftp'd *<filename>* from *<hostname>*
	Current config successfully tftp'd to *<hostname>*: *<filename>*
	More than one trunk found for LACP adminkey *<adminkey>*. Static MAC entry *<index>* was added only to trunk *<trunk number>*.
	Number of COSqs has been changed since boot. Save and reset the switch to activate the new configuration.
	Port *<port>* mode is changed to full duplex for 1000 Mbps operation.
	scheduled switch reboot
	switch reset at *<time>* has been canceled
	switch reset scheduled at *<time>*
	Warning: DHCP will be disabled
8021X	Authentication session terminated with {Failure	Success} on port *<port>*
8021X	Could not create failover checkpoint record for port *<port>*
8021X	Logoff request on port *<port>*
8021X	Port *<port>* {assigned to	removed from} vlan *<VLAN>*
8021X	RADIUS server *<IP address>* auth response for port *<port>* has an invalid Tunnel-Type value (*<tunnel type>*); should be 13 for VLAN assignment
8021X	RADIUS server *<IP address>* auth response for port *<port>* has an invalid Tunnel-Medium-Type value (*<tunnel type>*); should be 6 for VLAN assignment
8021X	RADIUS server *<IP address>* auth response for port *<port>* is missing one or more tunneling attributes for VLAN assignment
8021X	RADIUS server *<IP address>* auth response has a VLAN id (*<VLAN>*) of a reserved VLAN and cannot be assigned to port *<port>*
8021X	RADIUS server *<IP address>* auth response has a VLAN id (*<VLAN>*) of a non-existent or disabled VLAN, and cannot be assigned to port *<port>*

Thread	LOG_NOTICE Message (continued)
8021X	RADIUS server *<IP address>* auth response has an invalid VLAN id (*<VLAN>*) and cannot be assigned to port *<port>*
AMP	Access port *<port>* is receiving AMP packets from aggregator switch *<MAC address>*
AMP	Access trunk *<trunk ID>* is receiving AMP packets from {access	aggregator} switch *<MAC address>*
AMP	Aggregator port *<port>* is receiving AMP packets from access switch *<MAC address>*
AMP	Aggregator trunk *<trunk ID>* is receiving AMP packets from access switch *<MAC address>*
AMP	AMP group <group> topology is {DOWN	UP}
AMP	AMP keep-alive timeout on port *<port>*
AMP	AMP keep-alive timeout on trunk *<trunk ID>*
AMP	AMP packets looped back on port *<port>*
AMP	AMP packets looped back on trunk *<trunk ID>*
AMP	Discarding BPDUs received on port *<port>* while AMP is enabled
AMP	Dropping AMP v*<group>* packets received on port *<port>*, expecting v*<AMP version>*
AMP	Dropping AMP v*<group>* packets received on trunk *<trunk ID>*, expecting v*<AMP version>*
AMP	Multiple LACP trunks using admin key <group> are currently active
AMP	Port *<port>* is disabled by AMP BPDU guard
AMP	Putting port *<port>* in forwarding state
BGP	bad authentication received / no authentication received / authentication receive error from *<IP address>*
BGP	session established with *<IP address>*
CFG	Note: The configured AMP interval and timeout-count values result in a very short keep-alive timeout that may lead to unstable topologies in some configurations. The suggested keep-alive timeout is at least *<value>* centisecond[s]

Thread	LOG_NOTICE Message (continued)
CFG	Note: AMP switch type is {aggregator | access}; aggregator-{port | portchannel | trunk} configuration is ignored
CONSOLE	RADIUS: authentication timeout. Retrying...
CONSOLE	RADIUS: failed to contact primary | secondary server
CONSOLE	RADIUS: No configured RADIUS server
CONSOLE	RADIUS: trying alternate server...
HOTLINKS	"Error" is set to "Standby | Active"
HOTLINKS	"Learning" is set to "Standby | Active"
HOTLINKS	"None" is set to "Standby | Active"
HOTLINKS	"Side Max" is set to "Standby | Active"
HOTLINKS	has no "{Side Max | None | Learning | Error}" interface
IP	cannot contact multicast router *<IP address>*
IP	default gateway *<IP address>* {disabled | enabled | operational}
IP	Either Route or Arp table is full. Please check GEA L3 statistics (/stat/l3/gea) to verify.
IP	IGMP - {L3 IPMC | L3 IPv4 Multicas | Backup UP groups | Backup DOWN groups | IGMP groups | IPMC} table is full!
IP	IGMP - V1 timer is running for group *<IP address>*, vlan *<VLAN>*[, port *<port>*] Ignored leave!
IP	L3 table is full. Please check GEA L3 statistics (/stat/l3/gea) to verify.
IP	multicast router *<IP address>* operational
IP	New Multicast router learned on *<IP address>*, Vlan *<VLAN>*, Version V*<version>*
IP	Received {IGMPv1 | IGMPv2} query from *<IP address>*
IP	VLAN *<VLAN>* is not in the igmp relay list. Mrouter *<IP address>* will be down
IP	Warning: DHCP will be disabled
IP	Warning: Enabling dhcp will delete IP interface *<interface>* and IP gateway *<gateway>*'s configurations.

Thread	LOG_NOTICE Message (continued)
IP	Warning: Enabling dhcp will delete master switch IP interface and default gateway configurations.
IP	Warning: gateway (<*gateway*>) will be deleted
LACP	LACP is {up	down} on port <*port*>
LINK	link {down	up} on port <*port*>
LINK	Port <*port*> disabled by PVST Protection
MGMT	<*username*> automatically logged out from BBI because changing of authentication type
MGMT	<*username*>(<*user type*>) {logout	ejected	idle timeout	connection closed} from {BBI	Console	Telnet/SSH}
MGMT	<*username*>(<*user type*>) login {on Console	from host <*IP address*>	from BBI}
MGMT	ACL <*old number*> from old configuration file moved to ACL <*new number*> in new configuration file
MGMT	Authentication failed for backdoor.
MGMT	Authentication failed for backdoor. Password incorrect!
MGMT	Authentication failed for backdoor. Telnet disabled!
MGMT	boot config block changed
MGMT	boot image changed
MGMT	boot mode changed
MGMT	enable password changed
MGMT	Error in setting the new config
MGMT	Failed login attempt via {BBI	TELNET} from host <*IP address*>.
MGMT	Failed login attempt via the CONSOLE
MGMT	FLASH Dump cleared from BBI
MGMT	Membership for Port <*port*> in vlan <*VLAN*> is not effective while the port is assigned with PVID <*PVID*> by 802.1x
MGMT	New config set
MGMT	new configuration saved from ISCLI

Thread	LOG_NOTICE Message (continued)
MGMT	packet-buffer statistics cleared
MGMT	PANIC command from CLI
MGMT	PASSWORD FIX-UP MODE IN USE
MGMT	Password for {oper	operator} changed by {SNMP user	*<username>*}, notifying admin to save.
MGMT	Port *<port>* remains untagged while it is assigned PVID <PVID> by 802.1x
MGMT	RADIUS server timeouts
MGMT	RADIUS: authentication timeout. Retrying...
MGMT	RADIUS: failed to contact {primary|secondary} server
MGMT	RADIUS: No configured RADIUS server
MGMT	RADIUS: trying alternate server...
MGMT	scp*<username>*(*<user type>*) {logout	ejected	idle timeout	connection closed} from {Console	Telnet/SSH}
MGMT	scp*<username>*(*<user type>*) login {on Console	from host *<IP address>*}
MGMT	second syslog host changed to {this host	*<IP address>*}
MGMT	selectable [boot] mode changed
MGMT	STP BPDU statistics cleared
MGMT	switch reset from CLI
MGMT	syslog host changed to {this host	*<IP address>*}
MGMT	System clock set to <time>.
MGMT	System date set to <date>.
MGMT	Terminating BBI connection from host *<IP address>*
MGMT	Updated switch image to match master's image version. Reset needed
MGMT	User *<username>* deleted by {SNMP user	*<username>*}.
MGMT	User *<username>* is {deleted	disabled} and will be ejected by {SNMP user	*<username>*}
MGMT	User {oper	operator} is disabled and will be ejected by {SNMP user	*<username>*}.

Thread	LOG_NOTICE Message (continued)
MGMT	Wrong config file type
NTP	System clock updated
OSPF	Neighbor Router ID *<router ID>*, Neighbor State {Down	Loopback	Waiting	P To P	DR	BackupDR	DR Other	Attempt	Init	2 Way	ExStart	Exchange	Loading	Full}
OSPFV3	Link state database is FULL.Ignoring LSA.
OSPFV3	nbr *<router ID>* changes state from {DOWN	ATTEMPT	INIT	2WAY	EXSTART	EXCHANGE	LOADING	FULL} to {DOWN	ATTEMPT	INIT	2WAY	EXSTART	EXCHANGE	LOADING	FULL}[, Neighbor Down: {Interface down or detached	Dead timer expired}]
OSPFV3	virtual link nbr *<router ID>* changes state from {DOWN	ATTEMPT	INIT	2WAY	EXSTART	EXCHANGE	LOADING	FULL} to {DOWN	ATTEMPT	INIT	2WAY	EXSTART	EXCHANGE	LOADING	FULL}[, Neighbor Down: {Interface down or detached	Dead timer expired}]
SERVER	link {down	up} on port *<port>*
SERVER	MAC address *<MAC address>* for Vlan *<VLAN>* on {*<trunk>*	Port *<port>*} was {added to	removed from} network
SSH	(remote disconnect msg)
SSH	*<username>*(*<user type>*) {logout	ejected	idle timeout	connection closed} from {Console	Telnet/SSH}
SSH	*<username>*(*<user type>*) login {on Console	from host *<IP address>*}
SSH	Error in setting the new config
SSH	Failed login attempt via SSH
SSH	New config set
SSH	scp*<username>*(*<user type>*) {logout	ejected	idle timeout	connection closed} from {Console	Telnet/SSH}
SSH	scp*<username>*(*<user type>*) login {on Console	from host *<IP address>*}
SSH	Wrong config file type
STACK	*<MAC address>* become master {after init	from backup}
STACK	a specified master switch just joined the stack

Thread	LOG_NOTICE Message (continued)
STACK	A switch (*<MAC address>*) with no csnum assigned just joined.
STACK	attached switch *<MAC address>* cleared
STACK	BACKUP_GONE | BACKUP_PRESENT received from the master *<MAC address>*
STACK	BE_BACKUP | BE_MEMBER received from the master *<MAC address>*
STACK	BE_BACKUP | BE_MEMBER sent to *<MAC address>*
STACK	Boot Image successfully received by *<MAC address>*
STACK	CFG_REQ {received from | sent to} *<MAC address>*
STACK	CFG_SCRIPT received from the master *<MAC address>*
STACK	CFG_SCRIPT sent to *<MAC address>*
STACK	Config File successfully received by *<MAC address>>*
STACK	Current switch state changed, {all current sessions | current console session} will be terminated.
STACK	DELAYED_REBOOT timer expired
STACK	File *<File ID>* successfully received by *<MAC address>*
STACK	FORCED_DETACH received from the master *<MAC address>*
STACK	FORCED_DETACH sent to *<MAC address>*
STACK	I_AM_BACKUP {received from | sent to} *<MAC address>*
STACK	I_AM_MASTER received from the master *<MAC address>*
STACK	Image1 | 2 successfully received by *<MAC address>*
STACK	ingress application traffic {are blocked | is resumed}
STACK	JOIN_STACK received from *<MAC address>*
STACK	LEAVE_STACK received from *<MAC address>*
STACK	Link down on stack port *<csnum>*:*<port>* (MAC *<MAC address>*)
STACK	Link up on stack port *<csnum>*:*<port>*
STACK	local csnum changed to *<csnum>*
STACK	local ports disabled by local {master | switch}

Thread	LOG_NOTICE Message (continued)
STACK	local ports disabled by the master
STACK	local ports enabled by {local master	the master}
STACK	Member could not send the status of the tftp transfer to the master
STACK	Member switch booted with *<A>* cosQ. Master switch has *<B>* cosQ. Resetting to update.
STACK	merger of two stacks detected [on remote switch *<MAC address>*]
STACK	more than one specified master switches joined the stack
STACK	Newly {attached	configured} switch's boot config is {active	backup	factory}, updating to {active	backup	factory}
STACK	Newly attached switch's boot image is *<image>*. Not matching Master's boot image *<image>*, updating.
STACK	Newly attached switch's cosQ configuration is *<A>*. Not matching Master's cosQ configuration *<B>*, updating.
STACK	Newly attached switch's flash version is *<version>*. Not matching Master's version, updating image *<image>*.
STACK	Newly attached switch's NetConfig is {enabled	disabled}, updating to{enabled	disabled}
STACK	Newly attached switch's version matches Master's flash, but not current version. Please reset Master to allow new members to join.
STACK	Newly attached switch's version matches Master's version. Rebooting attached switch.
STACK	no master present now while one existed before
STACK	old master disappeared
STACK	PARAM_REQ_ATTACH received from the master *<MAC address>*
STACK	REQ_ATTACH received from *<MAC address>*
STACK	requested to reboot by the master
STACK	STACK: *<SFP type>* removed at port *<csnum>*:*<port>*
STACK	switch {revert	revert apply} from DC
STACK	Switch *<csnum>*, *<MAC address>* just joined.

Thread	LOG_NOTICE Message (continued)
STACK	switch apply from DC
STACK	switch save requested by the master
STACK	The specified backup (*<csnum>*) is the current master - a specified master; no backup will be selected in this case
STACK	TO_JOIN_STACK {received from | sent to} *<MAC address>*
SYSTEM	*<SFP name>* {Accepted|Approved} *<SPF type>*
SYSTEM	*<SFP type>* inserted at port *<csnum>*:*<port>*
SYSTEM	Address for interface *<interface>* ignored because of mismatch.
SYSTEM	Change fiber GIG port *<port>* mode to full duplex
SYSTEM	Change fiber GIG port *<port>* speed to 1000
SYSTEM	Changed ARP entry for IP *<IP address>* to: MAC <MAC address>, Port *<port>*, VLAN *<VLAN>*
SYSTEM	Could not add L2 multicast entry! L2 table is full.
SYSTEM	ECMP route gateway *<IP address>* is {down | up}
SYSTEM	Enable auto negotiation for copper GIG port: *<port>*
SYSTEM	I2C device <ID> <description> set to access state <state> [from CLI]
SYSTEM	Ingress PVST+ BPDU's spotted from port *<port>*
SYSTEM	link {down | up} on port *<port>*
SYSTEM	Mask for interface *<interface>* ignored because of mismatch.
SYSTEM	Port *<port>* disabled
SYSTEM	Port *<port>* disabled by BPDU Guard
SYSTEM	Port *<port>* disabled by OAM (unidirectional | TX-RX Loop)
SYSTEM	Port *<port>* disabled by PVST Protection
SYSTEM	Port *<port>* disabled by UDLD (unknown | unidirectional | bidirectional | TX-RX loop | neighbor mismatch)
SYSTEM	Port *<port>* disabled due to reason code *<reason code>*

Thread	LOG_NOTICE Message (continued)
SYSTEM	rebooted (*<reason>*)[, administrator logged in] Reason: ■ Boot watchdog reset ■ reset from console ■ console PANIC command ■ reset from EM ■ console RESET KEY ■ reset from Telnet/SSH ■ hard reset by SNMP ■ scheduled reboot ■ hard reset by WEB-UI ■ SMS-64 found an over-voltage ■ hard reset from console ■ SMS-64 found an under-voltage ■ hard reset from Telnet ■ software ASSERT ■ low memory ■ software PANIC ■ MM Cycled Power Domain ■ software VERIFY ■ power cycle ■ Telnet PANIC command ■ Reset Button was pushed ■ unknown reason ■ reset by SNMP ■ watchdog timer ■ reset by WEB-UI
SYSTEM	Received BOOTP Offer: IP: *<IP address>*, Mask: <netmask>, Broadcast *<IP address>*, GW: *<IP address>*
SYSTEM	Received DHCP Offer: IP: *<IP address>*, Mask: *<netmask>* Broadcast *<IP address>*, GW: *<IP address>*
SYSTEM	server with MAC address *<MAC address>* was {added to | removed from} network
SYSTEM	Static route gateway *<IP address>* is {down | up}
SYSTEM	Watchdog threshold changed from <old value> to <new value> seconds
SYSTEM	Watchdog timer has been {enabled | disabled}
TEAMING	error, action is undefined
TEAMING	is down, but teardown is blocked
TEAMING	is down, control ports are auto disabled
TEAMING	is up, control ports are auto controlled
UPGRADE	UFD couldn't be converted to Failover
UPGRADE	UpLinkFast is not supported in MSTP/RST/PVRST mode

Thread	LOG_NOTICE Message (continued)
VLAN	Default VLAN can not be deleted
VM	*<IP address>* moved from {port *<port>*	trunk IT *<trunk ID>*} to {port *<port>*	trunk IT *<trunk ID>*}
VM	Could not create check point entry for VM MAC [HOST]
VM	MAC address *<MAC address>* moved from {port *<port>*	trunk IT *<trunk ID>*} to {port *<port>*	trunk IT *<trunk ID>*}
VM	[(Refresh)] VI server unreachable or certificate invalid.
VM	Virtual Machine with {IP address *<IP address>*	MAC address *<MAC address>*} came online
VM	Virtual Machine with {IP address *<IP address>*	MAC address *<MAC address>*} changed its VLAN to *<new VLAN>*. It was previously in VLAN *<old VLAN>*
VM	Virtual Machine with {IP address *<IP address>*	MAC address *<MAC address>*} is a member of VLAN *<VLAN>*
VM	Virtual Machine with {IP address *<IP address>*	MAC address *<MAC address>*} is not in VLAN *<VLAN>* anymore
VM	[(Refresh)] VM agent command not implemented.
VM	[(Refresh)] VM agent could not be started.
VM	[(Refresh)] VM agent could not login to server.
VM	[(Refresh)] VM agent could not retrieve {host	VM} properties.
VM	[(Refresh)] VM agent encountered a file error.
VM	[(Refresh)] VM agent encountered an IPC error.
VM	[(Refresh)] VM agent file error.
VM	[(Refresh)] VM Agent not active.
VM	[(Refresh)] VM agent operation failed due to a conflict.
VM	[(Refresh)] VM agent operation failed.
VM	[(Refresh)] VM agent operation needs no change.
VM	[(Refresh)] VM agent operation timed out.
VM	[(Refresh)] VM agent protocol error.
VM	VM agent resumed (Refresh).

Thread	LOG_NOTICE Message (continued)
VM	VM agent resumed (Scan).
VM	[(Refresh)] VM agent timed out and could not be stopped.
VM	[(Refresh)] VM agent timed out.
VM	[(Refresh)] VM agent unable to logout from server.
VM	[(Refresh)] VM agent unknown error.
VM	[(Refresh)] VM agent VE limit reached.
VM	[(Refresh)] VM agent: Invalid ID.
VM	VM agent: local table full.
VM	VM MAC *<MAC address>* NOT added to hash table
VM	VM move detected but failed to move network conf
VRRP	virtual router *<IP address>* is now {BACKUP	MASTER}
VRRP	Virtual Router Group is disabled due to no enabled virtual routers.
WEB	*<username>* ejected from BBI
WEB	*<username>* ejected from BBI because username password was changed
WEB	RSA host key is being saved to Flash ROM, please don't reboot the box immediately.

LOG_WARNING

Thread	LOG_WARNING Message
	Changing numcos sets up the default COSq configuration. Please see diff.
8021X	Authentication session terminated with {Failure	Success} on port *<port>*
8021X	Could not create failover checkpoint record for port *<port>*
8021X	Logoff request on port *<port>*
8021X	Port *<port>* {assigned to|removed from} vlan *<VLAN>*
8021X	RADIUS server *<IP address>* auth response for port *<port>* has an invalid Tunnel-Type value (*<tunnel type>*); should be 13 for VLAN assignment
8021X	RADIUS server *<IP address>* auth response for port *<port>* has an invalid Tunnel-Medium-Type value (*<tunnel type>*); should be 6 for VLAN assignment
8021X	RADIUS server *<IP address>* auth response for port *<port>* is missing one or more tunneling attributes for VLAN assignment
8021X	RADIUS server *<IP address>* auth response has a VLAN id (*<VLAN>*) of a reserved VLAN and cannot be assigned to port *<port>*
8021X	RADIUS server *<IP address>* auth response has a VLAN id (*<VLAN>*) of a non-existent or disabled VLAN, and cannot be assigned to port *<port>*
8021X	RADIUS server *<IP address>* auth response has an invalid VLAN id (*<VLAN>*) and cannot be assigned to port *<port>*
AMP	Access port *<port>* is receiving AMP packets from access switch *<MAC address>*
CFG	Authentication should be disabled to run RIPv2 in RIPv1 compatibility mode on interface *<interface>*.
CFG	Multicast should be disabled to run RIPv2 in RIPv1 compatibility mode on interface *<interface>*.
CFG	Switch cannot support more than 16 protocols simultaneously!
CFG	Unfit config exists when protocol-vlan apply.
HOTLINKS	"Error" is set to "Standby	Active"
HOTLINKS	"Learning" is set to "Standby	Active"
HOTLINKS	"None" is set to "Standby	Active"

Thread	LOG_WARNING Message (continued)
HOTLINKS	"Side Max" is set to "Standby	Active"
HOTLINKS	has no "{Side Max	None	Learning	Error}" interface
IP	*<IP address>* configured as V*<version>* and received IGMP V{1	2} query
NTP	cannot contact any NTP server
NTP	cannot contact [primary	secondary] NTP server *<IP address>*
STACK	no master present in the stack so far
STACK	The specified backup (*<csnum>*) is the current master - a specified master; no backup will be selected in this case
SYSTEM	*<SFP name>* Removed *<SPF type>*
SYSTEM	*<SFP type>* removed at port *<csnum>*:*<port>*
SYSTEM	I2C device *<ID>* *<description>* set to access state *<state>* [from CLI]
SYSTEM	Interface <interface> failed to renew DHCP Lease.
TEAMING	error, action is undefined
TEAMING	is down, but teardown is blocked
TEAMING	is down, control ports are auto disabled
TEAMING	is up, control ports are auto controlled

Index

Symbols

Numerics

A

B

W