



# Alteon OS<sup>™</sup> Command Reference

Nortel 10Gb Uplink Ethernet Switch Module for IBM BladeCenter<sup>®</sup>  
Version 1.2

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# Preface

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The Alteon OS *Command Reference* describes how to configure and use the Alteon OS software with your Nortel 10Gb Uplink Ethernet Switch Module (GbE Switch Module).

For documentation on installing the switches physically, see the *Installation Guide* for your GbE Switch Module. For details about configuration and operation of your GbE Switch Module, see the Alteon OS *Application Guide*.

## Who Should Use This Book

---

This *Command Reference* 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

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**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, “Alteon OS Syslog Messages,”** shows a listing of syslog messages.

**Appendix B, “Alteon OS SNMP Agent,”** lists the Management Interface Bases (MIBs) supported in the switch software.

**“Glossary”** includes definitions of terminology used throughout the book.

**“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	Example
AaBbCc123	This type is used for names of commands, files, and directories used within the text.  It also depicts on-screen computer output and prompts.	View the <code>readme.txt</code> file.  Main#
<b>AaBbCc123</b>	This bold type appears in command examples. It shows text that must be typed in exactly as shown.	Main# <b>sys</b>
<AaBbCc123>	This italicized type appears in command examples as a parameter placeholder. Replace the indicated text with the appropriate real name or value when using the command. Do not type the brackets.  This also shows book titles, special terms, or words to be emphasized.	To establish a Telnet session, enter: host# <b>telnet</b> <IP address>  Read your <i>User's Guide</i> thoroughly.
[ ]	Command items shown inside brackets are optional and can be used or excluded as the situation demands. Do not type the brackets.	host# <b>ls</b> [-a]



## How to Get Help

---

If you need help, service, or technical assistance, see the “Getting help and technical assistance” appendix in the Nortel 10Gb Uplink Ethernet Switch Module for IBM BladeCenter *Installation Guide*.



## CHAPTER 1

# The Command Line Interface

---

Your GbE Switch Module (GbESM) 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 Alteon OS 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
- Alteon OS 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 via the management module
- Using a Telnet connection over the network
- Using a SSH connection to securely log into another computer over a network
- Using a serial connection using the serial port on the GbESM

### Management Module Setup

The BladeCenter GbE Switch Module is an integral subsystem within the overall BladeCenter system. The BladeCenter chassis includes a management module (MM) as the central element for overall chassis management and control.

You can use the 100-Mbps Ethernet port on the management module to configure and manage the GbE Switch Module. The GbE Switch Module communicates with the management module(s) through its internal port 15 (MGT), which you can access through the Ethernet port on each management module. The factory default settings will permit *only* management and control access to the switch module through the Ethernet port on the management module, or the built-in serial port. You can use the four external Ethernet ports on the switch module for management and control of the switch by selecting this mode as an option through the management module configuration utility program (see the applicable *BladeCenter Installation and User's Guide* publications for more information).

---

**NOTE** – Support for both management modules is included within the single management port (MGT). The MGT port dynamically connects to the active management module.

---

### Factory-Default vs. MM assigned IP Addresses

Each GbE Switch Module must be assigned its own Internet Protocol address, which is used for communication with an SNMP network manager or other transmission control protocol/Internet Protocol (TCP/IP) applications (for example, BootP or TFTP). The factory-default IP address is 10.90.90.9x, where x corresponds to the number of the bay into which the GbE

Switch Module is installed. For additional information, see the *Installation Guide*). The management module assigns an IP address of 192.168.70.1xx, where xx corresponds to the number of the bay into which each GbE Switch Module is installed, as shown in the following table:

**Table 1-1** GbESM IP addresses, based on switch-module bay numbers

Bay number	Factory-default IP address	IP address assigned by MM
Bay 1	10.90.90.91	192.168.70.127
Bay 2	10.90.90.92	192.168.70.128
Bay 3	10.90.90.94	192.168.70.129
Bay 4	10.90.90.97	192.168.70.130

---

**NOTE** – Switch Modules installed in Bay 1 and Bay 2 connect to server NICs 1 and 2, respectively. However, Windows operating systems show that Switch Modules installed in Bay 3 and Bay 4 connect to server NICs 4 and 3, respectively.

---

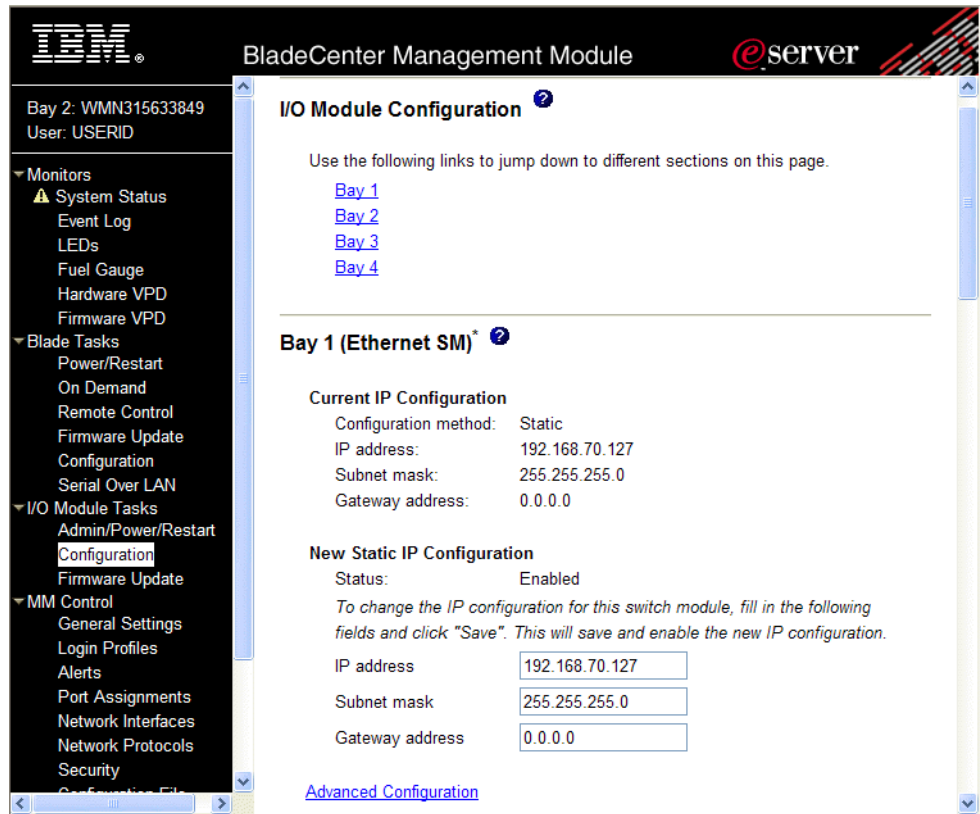
## Default Gateway

The default Gateway IP address determines where packets with a destination address outside the current subnet should be sent. Usually, the default Gateway is a router or host acting as an IP gateway to handle connections to other subnets of other TCP/IP networks. If you want to access the GbE Switch Module from outside your local network, use the management module to assign a default Gateway address to the GbE Switch Module. Choose **I/O Module Tasks > Configuration** from the navigation pane on the left, and enter the default Gateway IP address (for example, 192.168.70.125). Click **Save**.

## Configuring management module for switch access

Complete the following initial configuration steps:

1. **Connect the Ethernet port of the management module to a 10/100 Mbps network (with access to a management station) or directly to a management station.**
2. **Access and log on to the management module, as described in the *BladeCenter Management Module User's Guide*. The management module provides the appropriate IP addresses for network access (see the applicable *BladeCenter Installation and User's Guide* publications for more information).**
3. **Select Configuration on the I/O Module Tasks menu on the left side of the BladeCenter Management Module window. See [Figure 1-1](#).**



**Figure 1-1** Switch management on the BladeCenter management module

4. **You can use the default IP addresses provided by the management module, or you can assign a new IP address to the switch module through the management module. You can assign this IP address through one of the following methods:**
  - Manually through the BladeCenter management module
  - Automatically through the IBM Director Configuration Wizard (available in Director release 4.21)

---

**NOTE** – If you change the IP address of the GbE Switch Module, make sure that the switch module and the management module both reside on the same subnet.

---

## 5. Enable the following features in the management module:

- External Ports (**I/O Module Tasks > Admin/Power/Restart > Advance Setup**)
- External management over all ports (**Configuration > Advanced Configuration**)  
This setting is required if you want to access the management network through the external ports on the GbE Switch Module.

The default value is **Disabled** for both features. If these features are not already enabled, change the value to **Enabled**, then **Save**.

---

**NOTE** – In **Advanced Configuration > Advanced Setup**, enable “Preserve new IP configuration on all switch resets,” to retain the switch’s IP interface when you restore factory defaults. This setting preserves the management port’s IP address in the management module’s memory, so you maintain connectivity to the management module after a reset.

---

You can now start a Telnet session, Browser-Based Interface (Web) session, a Secure Shell session, or a secure HTTPS session to the GbE Switch Module.

## Connecting to the Switch via Telnet

Use the management module to access the GbE Switch Module through Telnet. Choose **I/O Module Tasks > Configuration** from the navigation pane on the left. Select a bay number and click **Advanced Configuration > Start Telnet/Web Session > Start Telnet Session**. A Telnet window opens a connection to the Switch Module (requires Java 1.4 Plug-in).

Once that you have configured the GbE Switch Module with an IP address and gateway, you can access the switch from any workstation connected to the management network. Telnet access provides the same options for user and administrator access as those available through the management module, minus certain Telnet and management commands.

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

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

## Running Telnet

Once the IP parameters on the GbE Switch Module are configured, you can access the CLI using a Telnet connection. From the management module, you can establish a Telnet connection with the switch.

You will then be prompted to enter a password as explained on [page 26](#).

## Establishing an SSH Connection

Although a remote network administrator can manage the configuration of a GbE Switch Module via Telnet, this method does not provide a secure connection. The SSH (Secure Shell) protocol enables you to securely log into another computer 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 or if another client has just logged in before this client. 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

The following SSH clients have been tested:

- SSH 1.2.23 and SSH 1.2.27 for Linux (freeware)
- SecureCRT 3.0.2 and SecureCRT 3.0.3 (Van Dyke Technologies, Inc.)
- F-Secure SSH 1.1 for Windows (Data Fellows)

---

**NOTE** – The Alteon OS implementation of SSH is based on SSH version 1.5 and supports SSH-1.5-1.X.XX. SSH clients of other versions (especially Version 2) are not supported.

---



## Running SSH

Once the IP parameters are configured and the SSH service is turned on the GbE Switch Module, you can access the command line interface using an SSH connection. The default setting for SSH access is disabled.

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 GbE Switch Module. 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 GbE Switch Module. Users may display information that has no security or privacy implications, such as switch statistics and current operational state information.
- Operators can make temporary changes on the GbE Switch Module. These changes are 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 GbE Switch Module. 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 43](#).

---

**Table 1-2** 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, except the management port.	oper

**Table 1-2** User Access Levels

<b>User Account</b>	<b>Description and Tasks Performed</b>	<b>Password</b>
Administrator	The superuser Administrator has complete access to all menus, information, and configuration commands on the GbE Switch Module, 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 Versus 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

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For a description of global commands, shortcuts, and command line editing functions, see [“Menu Basics” on page 47.](#)”

## Idle Timeout

---

By default, the switch will disconnect your Telnet session after five 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” on page 179.](#)



## CHAPTER 2

# First-Time Configuration

---

To help with the initial process of configuring your switch, the Alteon OS 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:

```
10Gb Uplink Ethernet Switch Module
18:44:05 Wed Jan 3, 2007
```

```
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 346](#).

---

### 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
```

## Setup Part 1: Basic System Configuration

When Setup is started, the system prompts:

```
"Set Up" will walk you through the configuration of
System Date and Time, Spanning Tree, Port Speed/Mode,
VLANs, and IP interfaces. [type Ctrl-C to abort "Set Up"]
-----
Will you be configuring VLANs? [y/n]
```

- 1. Enter **y** if you will be configuring VLANs. Otherwise enter **n**.**

If you decide not to configure VLANs during this session, you can configure them later using the configuration menus, or by restarting the Setup facility. For more information on configuring VLANs, see the *Alteon OS 1.4 Application Guide*.

Next, the Setup utility prompts you to input basic system information.

- 2. Enter the year of the current date at the prompt:**

```
Enter year [2007]:
```

Enter the last two digits of the year as a number from 00 to 99. "00" is considered 2000. To keep the current year, press <Enter>.

---

**NOTE** – When the GbE Switch Module is reset, the date and time revert to default values. Use `/cfg/sys/date` and `/cfg/sys/time` to re-enter the current date and time.

---

The system displays the date and time settings:

```
System clock set to 18:55:36 Wed Jan 3, 2007.
```

**3. Enter the month of the current system date at the prompt:**

```
System Date:  
Enter month [1]:
```

Enter the month as a number from 1 to 12. To keep the current month, press <Enter>.

**4. Enter the day of the current date at the prompt:**

```
Enter day [3]:
```

Enter the date as a number from 1 to 31. To keep the current day, press <Enter>.

**5. Enter the hour of the current system time at the prompt:**

```
System Time:  
Enter hour in 24-hour format [18]:
```

Enter the hour as a number from 00 to 23. To keep the current hour, press <Enter>.

**6. Enter the minute of the current time at the prompt:**

```
Enter minutes [55]:
```

Enter the minute as a number from 00 to 59. To keep the current minute, press <Enter>.

**7. Enter the seconds of the current time at the prompt:**

```
Enter seconds [37]:
```

Enter the seconds as a number from 00 to 59. To keep the current second, press <Enter>.

The system displays the date and time settings:

```
System clock set to 8:55:36 Wed Jan 3, 2007.
```

**8. Turn Spanning Tree Protocol on or off at the prompt:**

```
Spanning Tree:
Current Spanning Tree Group 1 setting: ON
Turn Spanning Tree Group 1 OFF? [y/n]
```

Enter **y** to turn off Spanning Tree, or enter **n** to leave Spanning Tree on.

**Setup Part 2: Port Configuration**


---

**NOTE** – When configuring port options for your switch, some of the prompts and options may be different.

---

**1. Select the port to configure, or skip port configuration at the prompt:**

```
Port Config:
Enter port (INT1-14, MGT, EXT1-4):
```

---

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

---

If you wish to change settings for individual ports, enter the number of the port you wish to configure. To skip port configuration, press <Enter> without specifying any port and go to [“Setup Part 3: VLANs” on page 38](#).

**2. Configure Gigabit Ethernet port flow parameters.**

If you selected a port that has a Gigabit Ethernet connector, the system prompts:

```
Gig Link Configuration:
Port Flow Control:
Current Port EXT1 flow control setting:    both
Enter new value ["rx"/"tx"/"both"/"none"]:
```

Enter **rx** to enable receive flow control, **tx** for transmit flow control, **both** to enable both, or **none** to turn flow control off for the port. To keep the current setting, press <Enter>.

### 3. Configure Gigabit Ethernet port autonegotiation mode.

If you selected a port that has a Gigabit Ethernet connector, the system prompts:

```
Port Auto Negotiation:
Current Port EXT1 autonegotiation:          on
Enter new value ["on"/"off"]:
```

Enter **on** to enable port autonegotiation, **off** to disable it, or press <Enter> to keep the current setting.

### 4. If configuring VLANs, enable or disable VLAN tagging for the port.

If you have selected to configure VLANs back in Part 1, the system prompts:

```
Port VLAN tagging config (tagged port can be a member of multiple VLANs)
Current TAG support:                        disabled
Enter new TAG support [d/e]:
```

Enter **d** to disable VLAN tagging for the port or enter **e** to enable VLAN tagging for the port. To keep the current setting, press <Enter>.

### 5. The system prompts you to configure the next port:

```
Enter port (INT1-14, MGT, EXT1-4):
```

When you are through configuring ports, press <Enter> without specifying any port. Otherwise, repeat the steps in this section.

## Setup Part 3: VLANs

If you chose to skip VLANs configuration back in Part 1, skip to [“Setup Part 4: IP Configuration” on page 39](#).

### 1. Select the VLAN to configure, or skip VLAN configuration at the prompt:

```
VLAN Config:
Enter VLAN number from 2 to 4094, NULL at end:
```

If you wish to change settings for individual VLANs, enter the number of the VLAN you wish to configure. To skip VLAN configuration, press <Enter> without typing a VLAN number and go to [“Setup Part 4: IP Configuration” on page 39](#).

### 2. Enter the new VLAN name at the prompt:

```
Current VLAN name: VLAN 2
Enter new VLAN name:
```

Entering a new VLAN name is optional. To use the pending new VLAN name, press <Enter>.

### 3. Enter the VLAN port numbers:

```
Define Ports in VLAN:
Current VLAN 2: empty
Enter ports one per line, NULL at end:
```

Enter each port, by port number or port alias, and confirm placement of the port into this VLAN. When you are finished adding ports to this VLAN, press <Enter> without specifying any port.

### 4. Configure Spanning Tree Group membership for the VLAN:

```
Spanning Tree Group membership:
Current Spanning Tree Group index: 1
Enter new Spanning Tree Group index [1-127]:
```

### 5. The system prompts you to configure the next VLAN:

```
VLAN Config:
Enter VLAN number from 2 to 4094, NULL at end:
```

Repeat the steps in this section until all VLANs have been configured. When all VLANs have been configured, press <Enter> without specifying any VLAN.

## Setup Part 4: IP Configuration

The system prompts for IP parameters.

### IP Interfaces

IP interfaces are used for defining subnets to which the switch belongs.

Up to 128 IP interfaces can be configured on the GbE Switch Module. The IP address assigned to each IP interface provide the switch with an IP presence on your network. No two IP interfaces can be on the same IP subnet. The interfaces can be used for connecting to the switch for remote configuration, and for routing between subnets and VLANs (if used).

#### 1. Select the IP interface to configure, or skip interface configuration at the prompt:

```
IP Config:

IP interfaces:
Enter interface number: (1-128)
```

If you wish to configure individual IP interfaces, enter the number of the IP interface you wish to configure. To skip IP interface configuration, press <Enter> without typing an interface number and go to [“Default Gateways” on page 40](#).

---

**NOTE** – Interface 128 is reserved for switch management. If you change the IP address of IF 128, you can lose the connection to the management module. Use the management module to change the IP address of the GbE Switch Module.

---

#### 2. For the specified IP interface, enter the IP address in dotted decimal notation:

```
Current IP address:      0.0.0.0
Enter new IP address:
```

To keep the current setting, press <Enter>.

#### 3. At the prompt, enter the IP subnet mask in dotted decimal notation:

```
Current subnet mask:      0.0.0.0
Enter new subnet mask:
```

To keep the current setting, press <Enter>.

**4. If configuring VLANs, specify a VLAN for the interface.**

This prompt appears if you selected to configure VLANs back in Part 1:

```
Current VLAN:      1
Enter new VLAN [1-4094]:
```

Enter the number for the VLAN to which the interface belongs, or press <Enter> without specifying a VLAN number to accept the current setting.

**5. At the prompt, enter *y* to enable the IP interface, or *n* to leave it disabled:**

```
Enable IP interface? [y/n]
```

**6. The system prompts you to configure another interface:**

```
Enter interface number: (1-128)
```

Repeat the steps in this section until all IP interfaces have been configured. When all interfaces have been configured, press <Enter> without specifying any interface number.

## Default Gateways

**1. At the prompt, select a default gateway for configuration, or skip default gateway configuration:**

```
IP default gateways:
Enter default gateway number: (1-4)
```

Enter the number for the default gateway to be configured. To skip default gateway configuration, press <Enter> without typing a gateway number and go to [“IP Routing” on page 41](#).

**2. At the prompt, enter the IP address for the selected default gateway:**

```
Current IP address:      0.0.0.0
Enter new IP address:
```

Enter the IP address in dotted decimal notation, or press <Enter> without specifying an address to accept the current setting.



3. **At the prompt, enter *y* to enable the default gateway, or *n* to leave it disabled:**

```
Enable default gateway? [y/n]
```

4. **The system prompts you to configure another default gateway:**

```
Enter default gateway number: (1-4)
```

Repeat the steps in this section until all default gateways have been configured. When all default gateways have been configured, press <Enter> without specifying any number.

## IP Routing

When IP interfaces are configured for the various subnets attached to your switch, IP routing between them can be performed entirely within the switch. This eliminates the need to send inter-subnet communication to an external router device. Routing on more complex networks, where subnets may not have a direct presence on the GbE Switch Module, can be accomplished through configuring static routes or by letting the switch learn routes dynamically.

This part of the Setup program prompts you to configure the various routing parameters.

1. **At the prompt, enable or disable forwarding for IP Routing:**

```
Enable IP forwarding? [y/n]
```

Enter *y* to enable IP forwarding. To disable IP forwarding, enter *n*. To keep the current setting, press <Enter>.

## Setup Part 5: Final Steps

1. **When prompted, decide whether to restart Setup or continue:**

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

Enter *y* to restart the Setup utility from the beginning, or *n* to continue.

2. **When prompted, decide whether you wish to review the configuration changes:**

```
Review the changes made? [y/n]
```

Enter *y* to review the changes made during this session of the Setup utility. Enter *n* to continue without reviewing the changes. We recommend that you review the changes.

**3. Next, decide whether to apply the changes at the prompt:**

```
Apply the changes? [y/n]
```

Enter **y** to apply the changes, or **n** to continue without applying. Changes are normally applied.

**4. At the prompt, decide whether to make the changes permanent:**

```
Save changes to flash? [y/n]
```

Enter **y** to save the changes to flash. Enter **n** to continue without saving the changes. Changes are normally saved at this point.

**5. If you do not apply or save the changes, the system prompts whether to abort them:**

```
Abort all changes? [y/n]
```

Enter **y** to discard the changes. Enter **n** to return to the “Apply the changes?” prompt.

---

**NOTE** – After initial configuration is complete, it is recommended that you change the default passwords as shown in [“Setting Passwords” on page 43](#).

---

## Optional Setup for Telnet Support

---

**NOTE** – This step is optional. Perform this procedure only if you are planning on connecting to the GbE Switch Module 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 SNMP and /or telnet 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
  pmirr    - Port Mirroring Menu
  l2       - Layer 2 Menu
  l3       - Layer 3 Menu
  qos      - QOS Menu
  acl      - Access Control List 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]
  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
  date   - Set system date
  time   - Set system time
  timezone - Set system timezone (daylight savings)
  olddst - Set system DST for US
  dlight - Set system daylight savings
  idle   - Set timeout for idle CLI sessions
  notice - Set login notice
  bannr  - Set login banner
  hprompt - Enable/disable display hostname (sysName) in CLI prompt
  reminder - Enable/disable Reminders
  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)
  http    - Enable/disable HTTP (Web) access
  https   - HTTPS Web Access Menu
  wport   - Set HTTP (Web) server port number
  snmp    - Set SNMP access control
  userbbi - Enable/disable user configuration from BBI
  tsbbi   - Enable/disable telnet/ssh configuration from BBI
  tnet    - Enable/disable Telnet access
  tnport  - Set Telnet server port number
  tport   - Set the TFTP Port for the system
  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 GbE Switch Module's 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 short-cuts 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 Command 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, performing port mirroring, and enabling or disabling Server Load Balancing functions. 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             up             print             pwd
lines           verbose          exit             quit
diff            apply           save             revert
revert apply
ping            traceroute      telnet           history
pushd          popd            who              chpass_p
chpass_s

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 3-1** Description of Global Commands

Command	Action
<b>? <i>command</i></b> <b>or help</b>	Provides more information about a specific command on the current menu. When used without the <i>command</i> parameter, a summary of the global commands is displayed.
<b>. or print</b>	Display the current menu.
<b>.. or up</b>	Go up one level in the menu structure.
<b>/</b>	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.
<b>lines</b>	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.
<b>diff</b>	Show any pending configuration changes.
<b>apply</b>	Apply pending configuration changes.
<b>save</b>	Write configuration changes to non-volatile flash memory.

**Table 3-1** Description of Global Commands

<b>Command</b>	<b>Action</b>
<b>revert</b>	Remove pending configuration changes between “apply” commands. Use this command to restore configuration parameters set since last <code>apply</code> .
<b>revert apply</b>	Remove pending or applied configuration changes between “save” commands. Use this command to remove any configuration changes made since last <code>save</code> .
<b>exit or quit</b>	Exit from the command line interface and log out.
<b>ping</b>	Use this command to verify station-to-station connectivity across the network. The format is as follows: <b>ping</b> <host name>   <IP address> [tries (1-32)] [msec delay]] Where <i>IP address</i> is the hostname or IP address of the device, <i>tries</i> (optional) is the number of attempts (1-32), <i>msec delay</i> (optional) is the number of milliseconds between attempts. The DNS parameters must be configured if specifying hostnames (see “ <a href="#">Domain Name System Configuration</a> ” on page 297).
<b>traceroute</b>	Use this command to identify the route used for station-to-station connectivity across the network. The format is as follows: <b>traceroute</b> <host name>  <IP address> [<max-hops (1-32)> [msec delay]] Where <i>IP address</i> is the hostname or IP address of the target station, <i>max-hops</i> (optional) is the maximum distance to trace (1-16 devices), and <i>delay</i> (optional) is the number of milliseconds for wait for the response. As with <code>ping</code> , the DNS parameters must be configured if specifying hostnames.
<b>pwd</b>	Display the command path used to reach the current menu.
<b>verbose n</b>	Sets the level of information displayed on the screen: <b>0</b> =Quiet: Nothing appears except errors—not even prompts. <b>1</b> =Normal: Prompts and requested output are shown, but no menus. <b>2</b> =Verbose: Everything is shown. When used without a value, the current setting is displayed.
<b>telnet</b>	This command is used to telnet out of the switch. The format is as follows: <b>telnet</b> <hostname>   <IP address> [port] Where <i>IP address</i> is the hostname or IP address of the device.
<b>history</b>	This command displays the most recent commands.
<b>pushd</b>	Save the current menu path, so you can jump back to it using <code>popd</code> .
<b>popd</b>	Go to the menu path and position previously saved by using <code>pushd</code> .
<b>who</b>	Displays a list of users that are logged on to the switch.
<b>chpass_p</b>	Configures the password for the primary TACACS+ server.

**Table 3-1** Description of Global Commands

<b>Command</b>	<b>Action</b>
<b>chpass_s</b>	Configures the password for the secondary TACACS+ server.

## 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 3-2** Command Line History and Editing Options

Option	Description
<b>history</b>	Display a numbered list of the last 64 previously entered commands.
<b>!!</b>	Repeat the last entered command.
<b>!<i>n</i></b>	Repeat the <i>n</i> <sup>th</sup> command shown on the history list.
<Ctrl-p>	(Also the up arrow key.) Recall the <i>previous</i> 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 <i>next</i> 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 <i>end</i> of the command line.
<Ctrl-b>	(Also the left arrow key.) Move the cursor <i>back</i> one position to the left.
<Ctrl-f>	(Also the right arrow key.) Move the cursor <i>forward</i> one position to the right.
<Backspace>	(Also the Delete key.) Erase one character to the left of the cursor position.
<Ctrl-d>	<i>Delete</i> one character at the cursor position.
<Ctrl-k>	<i>Kill</i> (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

---

## 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/12/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/12/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
  l2       - Layer 2 Information Menu
  l3       - Layer 3 Information Menu
  qos      - QoS Menu
  acl      - Show ACL information
  link     - Show link status
  port     - Show port information
  transcvr - Show Port Transceiver status
  dump     - Dump all information
```

The information provided by each menu option is briefly described in [Table 4-1](#), with pointers to detailed information.

**Table 4-1** Information Menu Options (/info)

---

### Command Syntax and Usage

---

#### **sys**

Displays the System Information Menu. For details, see [page 58](#).

---

#### **l2**

Displays the Layer 2 Information Menu. For details, see [page 74](#).

---

#### **l3**

Displays the Layer 3 Information Menu. For details, see [page 95](#).

---

#### **qos**

Displays the Quality of Service (QoS) Information Menu. For details, see [page 117](#).

---

#### **acl**

Displays the current configuration profile for each Access Control List (ACL) and ACL Group. For details, see [page 119](#).

---

#### **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 or yes)
- Link status (up, down or disabled)

For details, see [page 120](#).

---



**Table 4-1** Information Menu Options (/info)

---

**Command Syntax and Usage**

---

**port**

Displays port status information, including:

- Port alias and number
- Whether the port uses VLAN Tagging or not
- Port Fast Forwarding status
- FDB Learning status
- Flooding of unknown destination MAC status
- Port VLAN ID (PVID)
- Port name
- VLAN membership

For details, see [page 121](#).

---

**transcvr**

Displays the status of the port transceiver module on each Fiber External Port.

For details, see [page 123](#).

---

**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.

---

## `/info/sys` System Information

```
[System Menu]
  snmpv3   - SNMPv3 Information Menu
  chassis  - Show BladeCenter Chassis related information
  general  - Show general system information
  log      - Show last 100 syslog messages
  user     - Show current user status
  dump     - Dump all system information
```

The information provided by each menu option is briefly described in [Table 4-2](#), with pointers to where detailed information can be found.

**Table 4-2** System Menu Options (`/info/sys`)

---

### Command Syntax and Usage

---

#### **snmpv3**

Displays SNMPv3 Information Menu. To view the menu options, see [page 59](#).

---

#### **chassis**

Displays information about the BladeCenter chassis. For details, see [page 69](#).

---

#### **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 the 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 70](#).

---

#### **log**

Displays most recent syslog messages. For details, see [page 72](#).

---

#### **user**

Displays configured user names and their status. For details, see [page 73](#).

---

#### **dump**

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

---

## `/info/sys/snmpv3` SNMPv3 System Information Menu

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 4-3** SNMPv3 information Menu Options (`/info/sys/snmpv3`)

---

### Command Syntax and Usage

---

#### **usm**

Displays User Security Model (USM) table information. To view the table, see [page 61](#).

---

#### **view**

Displays information about view, sub-trees, mask and type of view. To view a sample, see [page 62](#).

---

#### **access**

Displays View-based Access Control information. To view a sample, see [page 63](#).

---

#### **group**

Displays information about the group that includes, the security model, user name, and group name. To view a sample, see [page 64](#).

---

#### **comm**

Displays information about the community table information. To view a sample, see [page 64](#).

---

#### **taddr**

Displays the Target Address table information. To view a sample, see [page 65](#).

---

**Table 4-3** SNMPv3 information Menu Options (/info/sys/snmpv3)

---

**Command Syntax and Usage**

---

**tparam**

Displays the Target parameters table information. To view a sample, see [page 66](#).

---

**notify**

Displays the Notify table information. To view a sample, see [page 67](#).

---

**dump**

Displays all the SNMPv3 information. To view a sample, see [page 68](#).

---

## **/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 4-4** USM User Table Information Parameters (/info/sys/usm)

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. Alteon OS 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 4-5** SNMPv3 View Table Information Parameters (`/info/sys/snmpv3/view`)

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	Prefix	Model	Level	Match	ReadV	WriteV	NotifyV
<code>vlv2grp</code>		<code>snmpv1</code>	<code>noAuthNoPriv</code>	<code>exact</code>	<code>iso</code>	<code>iso</code>	<code>vlv2only</code>
<code>admingrp</code>		<code>usm</code>	<code>authPriv</code>	<code>exact</code>	<code>iso</code>	<code>iso</code>	<code>iso</code>

**Table 4-6** SNMPv3 Access Table Information (`/info/sys/snmpv3/access`)

Field	Description
Group Name	Displays the name of group.
Prefix	Displays the prefix that is configured to match the values.
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, <code>noAuthNoPriv</code> , <code>authNoPriv</code> , or <code>authPriv</code> .
Match	Displays the match for the <code>contextName</code> . The options are: <code>exact</code> and <code>prefix</code> .
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 4-7** SNMPv3 Group Table Information Parameters (/info/sys/snmpv3/group)

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 4-8** SNMPv3 Community Table Parameters (/info/sys/snmpv3/comm)

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 4-9** SNMPv3 Target Address Table Information Parameters (/info/sys/snmpv3/taddr)

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 4-10** SNMPv3 Target Parameters Table Information (`/info/sys/snmpv3/tparam`)

Field	Description
Name	Displays the locally arbitrary, but unique identifier associated with this <code>snmpTargetParamsEntry</code> .
MP Model	Displays the Message Processing Model used when generating SNMP messages using this entry.
User Name	Displays the <code>securityName</code> , 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 <code>inconsistentValue</code> 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 4-11** SNMPv3 Notify Table Information (`/info/sys/snmpv3/notify`)

Field	Description
Name	The locally arbitrary, but unique identifier associated with this <code>snmpNotifyEntry</code> .
Tag	This represents a single tag value which is used to select entries in the <code>snmpTargetAddrTable</code> . Any entry in the <code>snmpTargetAddrTable</code> 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 Prefix Model   Level           Match ReadV   WriteV   NotifyV
-----
v1v2grp          snmpv1 noAuthNoPriv exact   iso       iso       v1v2only
admingrp         usm     authPriv    exact   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       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/chassis

### BladeCenter Chassis Information

IBM BladeCenter Chassis Related Information:

```
Switch Module Bay = 1
Chassis Type      = Enterprise
POST Results      = 0xff
```

Management Module Control -

```
Default Configuration      = FALSE
Skip Extended Memory Test  = FALSE
Disable External Ports     = FALSE
POST Diagnostics Control   = Normal Diagnostics
```

```
Control Register          = 0x19
Extended Control Register  = 0x00
```

Management Module Status Reporting -

```
Device PowerUp Complete   = TRUE
Over Current Fault        = FALSE
Fault LED                  = OFF
Primary Temperature Warning = OK
Secondary Temperature Warning = OK
```

```
Status Register           = 0x40
Extended Status Register   = 0x01
```

Chassis information includes details about the BladeCenter chassis and management module settings.

## /info/sys/general

### General System Information

```

System Information at 0:16:42 Wed Jan 3, 2007
Time zone: No timezone configured

Nortel 10Gb Uplink Ethernet Switch Module

Switch is up 5 days, 2 hours, 16 minutes and 42 seconds.
Last boot: 0:00:47 Wed Jan 3, 2007 (power cycle)

MAC address: 00:11:58:ad:a3:00 Management IP Address (if 128):
10.90.90.97
Software Version 1.2.0 (FLASH image1), factory default configura-
tion.

PCBA Part Number:      317857-A
FAB Number:           EL4512011
Serial Number:        YJ1WDW47N277
Manufacturing Date:
Hardware Revision:    0
Board Revision:       0
PLD Firmware Version: 5.0

Temperature Sensor 1 (Warning): 42.5 C (Warn at 85.0 C/
Recover at 79.0 C)
Temperature Sensor 2 (Shutdown): 44.0 C (Warn at 93.0 C/
Recover at 86.0 C)
Temperature Sensor 3 (Exhaust): 42.5 C
Temperature Sensor 4 (Inlet): 42.5 C

Switch is in I/O Module Bay 0

```

---

**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

- IP address of IP interface #1
- Hardware version and part number
- Software image file and version number
- Configuration name
- 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 INT1
Jul 8	17:25:41	NOTICE	system: link up on port INT8
Jul 8	17:25:41	NOTICE	system: link up on port INT7
Jul 8	17:25:41	NOTICE	system: link up on port INT2
Jul 8	17:25:41	NOTICE	system: link up on port INT1
Jul 8	17:25:41	NOTICE	system: link up on port INT4
Jul 8	17:25:41	NOTICE	system: link up on port INT3
Jul 8	17:25:41	NOTICE	system: link up on port INT6
Jul 8	17:25:41	NOTICE	system: link up on port INT5
Jul 8	17:25:41	NOTICE	system: link up on port EXT4
Jul 8	17:25:41	NOTICE	system: link up on port EXT1
Jul 8	17:25:41	NOTICE	system: link up on port EXT3
Jul 8	17:25:41	NOTICE	system: link up on port EXT2
Jul 8	17:25:41	NOTICE	system: link up on port INT3
Jul 8	17:25:42	NOTICE	system: link up on port INT2
Jul 8	17:25:42	NOTICE	system: link up on port INT4
Jul 8	17:25:42	NOTICE	system: link up on port INT3
Jul 8	17:25:42	NOTICE	system: link up on port INT6
Jul 8	17:25:42	NOTICE	system: link up on port INT5
Jul 8	17:25:42	NOTICE	system: link up on port INT1
Jul 8	17:25:42	NOTICE	system: link up on port INT6

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**

```
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/l2` Layer 2 Information

---

[Layer 2 Menu]	
<code>fdb</code>	- Forwarding Database Information Menu
<code>lacp</code>	- Link Aggregation Control Protocol Menu
<code>gvrp</code>	- GVRP information Menu
<code>8021x</code>	- Show 802.1x information
<code>stg</code>	- Show STP information
<code>cist</code>	- Show CIST information
<code>trunk</code>	- Show Trunk Group information
<code>vlan</code>	- Show VLAN information
<code>gen</code>	- Show general information
<code>dump</code>	- Dump all layer 2 information

The information provided by each menu option is briefly described in [Table 4-12](#), with pointers to where detailed information can be found.

**Table 4-12** Layer 2 Menu Options (`/info/l2`)

---

### Command Syntax and Usage

---

#### **fdb**

Displays the Forwarding Database Information Menu. For details, see [page 76](#).

---

#### **lacp**

Displays the Link Aggregation Control Protocol Menu. For details, see [page 78](#).

---

#### **gvrp**

Displays the GVRP Menu. For details, see [page 79](#).

---

#### **8021x**

Displays the 802.1x Information Menu. For details, see [page 83](#).

---

**Table 4-12** Layer 2 Menu Options (/info/l2)

---

**Command Syntax and Usage**

---

**stg**

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

For details, see [page 85](#).

---

**cist**

Displays Common internal Spanning Tree (CIST) bridge information, including the following:

- Priority
- Hello interval
- Maximum age value
- Forwarding delay

You can also view port-specific CIST information, including the following:

- Port number and priority
- Cost
- State

For details, see [page 91](#).

---

**trunk**

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

For details, see [page 93](#).

---

**vlan**

Displays VLAN configuration information, including:

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

For details, see [page 94](#).

---

**gen**

Displays general Layer 2 information.

---

**Table 4-12** Layer 2 Menu Options (/info/l2)**Command Syntax and Usage****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/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
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 4-13** FDB Information Menu Options (/info/l2/fdb)**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, xxxxxxxxxxxxxx. For example, 080020123456.

**port** <port number or alias>

Displays all FDB entries for a particular port.

**vlan** <VLAN number (1-4095)>

Displays all FDB entries on a single VLAN.

**Table 4-13** FDB Information Menu Options (/info/l2/fdb)**Command Syntax and Usage**

**state unknown | ignore | forward | flood | trunk | ifmac**

Displays all FDB entries of a particular state.

**dump**

Displays all entries in the Forwarding Database. For more information, see [page 77](#).

## **/info/l2/fdb/dump**

### Show All FDB Information

MAC address	VLAN	Port	Trnk	State
-----	----	----	----	-----
00:04:38:90:54:18	1	EXT4		FWD
00:09:6b:9b:01:5f	1	INT13		FWD
00:09:6b:ca:26:ef	4095	MGT		FWD
00:0f:06:ec:3b:00	4095	MGT		FWD
00:11:43:c4:79:83	1	EXT4		FWD
00:11:f9:36:71:00	4095	MGT		FWD
00:13:0a:4d:3c:00	4095	MGT		FWD

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.”

If the state for the port is listed as an interface (IF), the MAC address is for a standard VRRP virtual router.

### Clearing Entries from the Forwarding Database

To delete a MAC address from the forwarding database (FDB) or to clear the entire FDB, refer to “[Forwarding Database Maintenance](#)” on [page 353](#).

## `/info/12/lacp` Link Aggregation Control Protocol Information

[LACP Menu]

```
aggr      - Show LACP aggregator information for the port
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 GbE Switch Module.

**Table 4-14** LACP Menu Options (`/info/12/lacp`)

---

### Command Syntax and Usage

---

#### **aggr**

Displays detailed information of the LACP aggregator used by the selected port.

---

#### **port**

Displays LACP information about the selected port.

---

#### **dump**

Displays a summary of LACP information. For details, see [page 78](#).

---

## `/info/12/lacp/dump` Show all LACP Information

port	lacp	adminkey	operkey	selected	prio	attached	trunk
						aggr	
-----							
INT1	active	30	30	y	32768	17	19
INT2	active	30	30	y	32768	17	19
INT3	off	19	19	n	32768	--	--
INT4	off	20	20	n	32768	--	--
...							

LACP dump includes the following information for each external port in the GbESM:

- **lacp**  
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.
- **attached aggr**  
Displays the aggregator associated with each port.
- **trunk**  
This value represents the LACP trunk group number.

## info/l2/gvrp

### GVRP Information

```
[GVRP Information Menu]
gvr      - Display GVRP status
gvd      - Display GVD database
gid      - Display GID state machines
ring     - Display GID port ring
dump     - Display all GVRP information
```

Use these commands to display Generic VLAN Registration Protocol (GVRP) status information for the GbE Switch Module.

**Table 4-15** GVRP Information Menu Options (/info/l2/gvrp)

---

#### Command Syntax and Usage

---

##### **gvr**

Displays general GVRP status information.

---

##### **gvd**

Displays GVRP VLAN database information. For details, see [page 80](#).

---

##### **gid**

Displays GARP Information Declaration (GID) information. For details, see [page 81](#).

---

##### **ring**

Displays information about the GID port ring. For details, see [page 82](#).

---

##### **dump**

Displays a summary of GVRP information.

---

**info/12/gvrp/gvd**

## Show GVRP VLAN Database Information

```
GVRP (ENABLED) VLAN DATABASE
=====
VLAN 1, registration state FIXED
static ports  INT1-INT14  EXT1-EXT4
dynamic ports  empty

VLAN 10, registration state NORMAL
static ports  empty
dynamic ports  INT2 EXT4
```

The GVRP VLAN Database table provides basic GVRP information for each VLAN, as follows:

- GVRP Registration state:
  - Normal: The VLAN responds normally to GVRP registration information. Dynamic VLANs have a normal registration state.
  - Fixed: The VLAN ignores GVRP registration information. Static VLANs have a fixed registration state.
  - Forbidden: The VLAN does not participate in GVRP.

---

**NOTE** – Management VLAN 4095 is not registered in GVRP. The switch declines any Join request received for VLAN 4095, and generates a syslog message.

---

- Static port members
- Dynamic port members



## info/12/gvrp/gid

### Show GID State Machine Information

```
GID machines for VLAN 10, index 2, gvrp_state: NORMAL

in_use: TRUE - enabled: TRUE
Static ports: empty
Dynamic ports: INT2 EXT4
Combined ports: INT2 EXT4
Port  App Reg|Port  App Reg|Port  App Reg|Port  App Reg|Port  App Reg|
-----|-----|-----|-----|-----|
INT1  -  - |INT2  QA  INn|INT3  -  - |INT4  -  - |INT5  -  - |
-----|-----|-----|-----|-----|
INT6  -  - |INT7  -  - |INT8  -  - |INT9  -  - |INT10 -  - |
-----|-----|-----|-----|-----|
INT11 -  - |INT12 -  - |INT13 -  - |INT14 -  - |EXT1  -  - |
-----|-----|-----|-----|-----|
EXT2  -  - |EXT3  -  - |EXT4  QA  INn|
-----|-----|-----|
```

For each GVRP-registered VLAN, the GID State Machine table indicates the GVRP participation of switch ports. It also displays the ports' current Applicant and Registrar states.

[Table 4-16](#) lists the possible GVRP applicant states for the port. The GVRP port's Applicant transitions from one state to another as it processes GPDUs.

**Table 4-16** GVRP Port Applicant States

State	Description
VA	Very anxious, Active member
AA	Anxious, Active member
QA	Quiet, Active member
LA	Leaving, Active member
VP	Very anxious, Passive member
AP	Anxious, Passive member
QP	Quiet, Passive member
VO	Very anxious, Observer
AO	Anxious, Observer
QO	Quiet, Observer
LO	Leaving, Observer

Table 4-17 lists the possible GVRP registrar states for the port. The registrar receives GVRP messages from other GVRP participants on the network. Registrar states are further defined as follows:

- **Normal registration:** The registrar responds normally to incoming GPDUs. Corresponding states are displayed as INn, LV, and MT.
- **Fixed registration:** The registrar ignores all GPDUs, and remains in the IN state. Corresponding states are displayed as INr, LVr, and MTr.
- **Forbidden registration:** The registrar ignores all GPDUs, and remains in the MT state. Corresponding states are displayed as INf, LVf, and MTf.

**Table 4-17** GVRP Port Registrar States

State	Description
IN	The GVRP port's Registrar has registered with the VLAN on this network.
LV	The GVRP port's Registrar has received a Leave message. The registrar is timing out the GVRP registration on the VLAN. If there is no declaration for this VLAN before the Leave timer expires, the Registrar state becomes MT (empty).
MT	The GVRP port's Registrar has withdrawn from this VLAN on this network.

## info/l2/gvrp/ring

### Show GID Port Ring Information

```
PORT RING
=====
port EXT4, enabled, connected
port EXT3, enabled, connected
```

The port ring table shows whether individual ports are participating in GVRP (as shown above), or if the ports are members of a trunk group (as shown below).

```
PORT RING
=====
trunk 1, enabled, connected
```

## /info/12/8021x

### 802.1x Information

```

System capability : Authenticator
System status    : disabled
Protocol version : 1

```

Port	Auth Mode	Auth Status	Authenticator PAE State	Backend Auth State
INT1	force-auth	authorized	initialize	initialize
*INT2	force-auth	authorized	initialize	initialize
*INT3	force-auth	authorized	initialize	initialize
*INT4	force-auth	authorized	initialize	initialize
*INT5	force-auth	authorized	initialize	initialize
*INT6	force-auth	authorized	initialize	initialize
*INT7	force-auth	authorized	initialize	initialize
*INT8	force-auth	authorized	initialize	initialize
INT9	force-auth	authorized	initialize	initialize
INT10	force-auth	authorized	initialize	initialize
*INT11	force-auth	authorized	initialize	initialize
*INT12	force-auth	authorized	initialize	initialize
*INT13	force-auth	authorized	initialize	initialize
*INT14	force-auth	authorized	initialize	initialize
*MGT	force-auth	authorized	initialize	initialize
EXT1	force-auth	authorized	initialize	initialize
EXT2	force-auth	authorized	initialize	initialize
*EXT3	force-auth	authorized	initialize	initialize
EXT4	force-auth	authorized	initialize	initialize

\* - Port down or disabled

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

The following table describes the IEEE 802.1x parameters.

**Table 4-18** 802.1x Parameter Descriptions (/info/l2/8021x)

<b>Parameter</b>	<b>Description</b>
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: <ul style="list-style-type: none"> <li>■ force-unauth</li> <li>■ auto</li> <li>■ force-auth</li> </ul>
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: <ul style="list-style-type: none"> <li>■ initialize</li> <li>■ disconnected</li> <li>■ connecting</li> <li>■ authenticating</li> <li>■ authenticated</li> <li>■ aborting</li> <li>■ held</li> <li>■ forceAuth</li> </ul>
Backend Auth State	Displays the Backend Authorization State. The Backend Authorization state can be one of the following: <ul style="list-style-type: none"> <li>■ initialize</li> <li>■ request</li> <li>■ response</li> <li>■ success</li> <li>■ fail</li> <li>■ timeout</li> <li>■ idle</li> </ul>

## /info/12/stg

### Spanning Tree Information

```

-----
upfast disabled, update 40
-----
Spanning Tree Group 1: On (STP/PVST+)
Static VLANs: 1 10
Dynamic VLANs: 30

Current Root:                Path-Cost  Port Hello MaxAge FwdDel
8000 00:16:60:f9:1e:00      0 (null)   2    20    15

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

Port  Priority  Cost  FastFwd  State  Designated Bridge  Des Port
-----
INT1      0      0      n  FORWARDING  *
INT2      0      0      n  FORWARDING  *
INT3      0      0      n  FORWARDING  *
INT4      0      0      n  FORWARDING  *
INT5      0      0      n  FORWARDING  *
INT6      0      0      n  FORWARDING  *
INT7      0      0      n  FORWARDING  *
INT8      0      0      n  FORWARDING  *
INT9      0      0      n  DISABLED    *
INT10     0      0      n  FORWARDING  *
INT11     0      0      n  FORWARDING  *
INT12     0      0      n  FORWARDING  *
INT13     0      0      n  FORWARDING  *
INT14     0      0      n  FORWARDING  *
EXT1     128     2      n  DISABLED
EXT2     128     2      n  DISABLED
EXT3     128     2      n  FORWARDING  8000-00:16:60:f9:1e:00  8013
EXT4     128    4!      n  FORWARDING  8000-00:16:60:f9:1e:00  8014
* = STP turned off for this port.
! = Automatic path cost.

```

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

The switch software uses the IEEE 802.1d Spanning Tree Protocol (STP). 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:

- Slot number
- Port alias and priority
- Cost
- State

The following table describes the STG parameters.

**Table 4-19** Spanning Tree Parameter Descriptions

Parameter	Description
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 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.

**Table 4-19** Spanning Tree Parameter Descriptions (Continued)

<b>Parameter</b>	<b>Description</b>
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 BLOCKING, LISTENING, LEARNING, FORWARDING, or DISABLED.
Designated Bridge	The Designated Bridge shows information about the bridge connected to each port, if applicable. Information includes the priority (hex) 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/stg RSTP/MSTP Information

```

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

Current Root:          Path-Cost  Port Hello MaxAge FwdDel
8000 00:11:58:ae:39:00      0    EXT4    2    20    15

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

Port  Prio  Cost    State  Role Designated Bridge      Des Port  Type
-----
INT1   0      0    DSB *
INT2   0      0    DSB *
INT3   0      0    FWD *
INT4   0      0    DSB *
INT5   0      0    DSB *
INT6   0      0    DSB *
INT7   0      0    DSB *
INT8   0      0    DSB *
INT9   0      0    DSB *
INT10  0      0    DSB *
INT11  0      0    DSB *
INT12  0      0    DSB *
INT13  0      0    DSB *
INT14  0      0    DSB *
EXT1   128    2000  FWD   DESG 8000-00:11:58:ae:39:00  8011    P2P
EXT2   128    2000  DISC  BKUP 8000-00:11:58:ae:39:00  8011    P2P
EXT3   128    2000  FWD   DESG 8000-00:11:58:ae:39:00  8013    P2P
EXT4   128    20000 DISC  BKUP 8000-00:11:58:ae:39:00  8013    Shared
* = STP turned off for this port.

```

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

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 [page 225](#)), you can view RSTP/MSTP bridge information for the Spanning Tree Group, including the following:

- Priority
- Hello interval
- Maximum age value
- Forwarding delay
- Aging time



You can view port-specific RSTP information, including the following:

- Port number and priority
- Cost
- State

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

**Table 4-20** 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 (hex) and MAC address of the root.
Priority (bridge)	The bridge priority parameter controls which bridge on the network will become the STP 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 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 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).

**Table 4-20** RSTP/MSTP Parameter Descriptions (Continued)

<b>Parameter</b>	<b>Description</b>
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 (hex) 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/12/cist

### Common Internal Spanning Tree Information

```

Common Internal Spanning Tree:

VLANs: 2-4094

Current Root:          Path-Cost  Port MaxAge FwdDel
8000 00:11:58:ae:39:00      0      0     20    15

Cist Regional Root:    Path-Cost
8000 00:11:58:ae:39:00      0

Parameters:  Priority  MaxAge  FwdDel  Hops
              32768    20      15     20
Port  Prio  Cost      State  Role Designated Bridge      Des Port Hello Type
-----
INT1   0      0  DSB *
INT2   0      0  DSB *
INT3   0      0  FWD *
INT4   0      0  DSB *
INT5   0      0  DSB *
INT6   0      0  DSB *
INT7   0      0  DSB *
INT8   0      0  DSB *
INT9   0      0  DSB *
INT10  0      0  DSB *
INT11  0      0  DSB *
INT12  0      0  DSB *
INT13  0      0  DSB *
INT14  0      0  DSB *
MGT    0      0  FWD *
EXT1   128    20000  FWD  DESG 8000-00:11:58:ae:39:00  8011  2  P2P
EXT2   128    20000  DISC BKUP 8000-00:11:58:ae:39:00  8011  2  P2P
EXT3   128    20000  FWD  DESG 8000-00:11:58:ae:39:00  8013  2  P2P
EXT4   128    20000  DISC BKUP 8000-00:11:58:ae:39:00  8013  2  Shared
* = STP turned off for this port.

```

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

In addition to seeing if Common Internal Spanning Tree (CIST) is enabled or disabled, you can view CIST bridge information, including the following:

- Priority
- Maximum age value
- Forwarding delay

You can view port-specific CIST information, including the following:

- Port number and priority
- Cost
- Link type and Port type

The following table describes the CIST parameters.

**Table 4-21** CIST Parameter Descriptions

<b>Parameter</b>	<b>Description</b>
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.
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.
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).

**Table 4-21** CIST Parameter Descriptions

Parameter	Description
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 (hex) 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/12/trunk` Trunk Group Information

```
Trunk group 1, port state:
  EXT1: STG 1 forwarding
  EXT2: 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	INT1-INT14 EXT1-EXT4
10	VLAN 10	ena	INT1
11	*VLAN 11	ena	EXT3
30	*VLAN 30	ena	EXT4
4095	Mgmt VLAN	ena	INT1-INT14 MGT

(\*) = Dynamically created VLAN

Private-VLAN	Type	Mapped-To	Status	Ports
1000	primary	1001-1014	ena	EXT1 EXT2
1001	isolated	1000	ena	INT1
1002	community	1000	ena	INT2
1003	community	1000	ena	INT3

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

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-based VLAN information
- Whether the VLAN is a GVRP dynamic VLAN
- Private VLAN configuration

## /info/13

# Layer 3 Information

---

### [Layer 3 Menu]

route	- IP Routing Information Menu
arp	- ARP Information Menu
bgp	- BGP Information Menu
ospf	- OSPF Routing Information Menu
rip	- RIP Routing Information Menu
ip	- Show IP information
igmp	- Show IGMP Snooping Multicast Group information
vrrp	- Show Virtual Router Redundancy Protocol information
dump	- Dump all layer 3 information

The information provided by each menu option is briefly described in [Table 4-22](#), with pointers to detailed information.

**Table 4-22** Layer 3 Menu Options (/info/13)

---

### 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 97](#).

---

#### arp

Displays the Address Resolution Protocol (ARP) Information Menu. For details, see [page 100](#).

---

#### bgp

Displays BGP Information Menu. To view menu options, see [page 102](#).

---

#### ospf

Displays OSPF routing Information Menu. For details, see [page 105](#).

---

#### rip

Displays Routing Information Protocol Menu. For details, see [page 110](#).

---

**Table 4-22** Layer 3 Menu Options (/info/l3)

---

**Command Syntax and Usage**

---

**ip**

Displays IP Information. For details, see [page 112](#).

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 information: Enable status, lnet and lmask
  - Port status
- 

**igmp**

Displays IGMP Information Menu. For details, see [page 113](#).

---

**vrrp**

Displays the VRRP Information Menu. For details, see [page 116](#).

---

**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/13/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 4-23** Route Information Menu Options (/info/13/route)

---

#### 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 4-24 on page 98](#).

---

**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 4-25 on page 99](#).

---

**if** <interface number (1-128)>

Displays routes on a single interface.

---

**dump**

Displays all routes configured in the switch. For more information, see [page 98](#).

---

## /info/13/route/dump

### Show All IP Route Information

Status code: * - best						
Destination	Mask	Gateway	Type	Tag	Metr	If
* 11.0.0.0	255.0.0.0	11.0.0.1	direct	fixed		211
* 11.0.0.1	255.255.255.255	11.0.0.1	local	addr		211
* 11.255.255.255	255.255.255.255	11.255.255.255	broadcast	broadcast		211
* 12.0.0.0	255.0.0.0	12.0.0.1	direct	fixed		12
* 12.0.0.1	255.255.255.255	12.0.0.1	local	addr		12
* 12.255.255.255	255.255.255.255	12.255.255.255	broadcast	broadcast		12
* 13.0.0.0	255.0.0.0	11.0.0.2	indirect	ospf		2 211
* 47.0.0.0	255.0.0.0	47.133.88.1	indirect	static		24
* 47.133.88.0	255.255.255.0	47.133.88.46	direct	fixed		24
* 172.30.52.223	255.255.255.255	172.30.52.223	broadcast	broadcast		2
* 224.0.0.0	224.0.0.0	0.0.0.0	martian	martian		
* 224.0.0.5	255.255.255.255	0.0.0.0	multicast	addr		

The following table describes the Type parameters.

**Table 4-24** 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 4-25** IP Routing Tag Parameters

<b>Parameter</b>	<b>Description</b>
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 GbE Switch Module.
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
  dump      - Show all ARP entries
  addr      - Show ARP address list
```

The ARP information includes IP address and MAC address of each entry, address status flags (see [Table 4-26 on page 100](#)), VLAN and port for the address, and port referencing information.

**Table 4-26** ARP Information Menu Options (/info/l3/arp)

---

#### **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 (1-4095)>  
Displays the ARP entries on a single VLAN.

---

**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 101](#).

---

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

---

**/info/13/arp/dump**

Show All ARP Entry Information

IP address	Flags	MAC address	VLAN	Port
47.80.22.1		00:e0:16:7c:28:86	1	INT6
47.80.23.243	P	00:03:42:fa:3b:30	1	
47.80.23.245		00:c0:4f:60:3e:c1	1	INT6
190.10.10.1	P	00:03:42:fa:3b:30	10	

**NOTE** – If you have VMA turned on, the referenced port will be the designated port. If you have VMA turned off, the designated port will be the normal ingress port.

The Flag field is interpreted as follows:

**Table 4-27** 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/13/arp/addr**

### ARP Address List Information

IP address	IP mask	MAC address	VLAN	Flags
205.178.18.66	255.255.255.255	00:70:cf:03:20:04		P
205.178.50.1	255.255.255.255	00:70:cf:03:20:06	1	
205.178.18.64	255.255.255.255	00:70:cf:03:20:05	1	

## **/info/13/bgp**

### BGP Information

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

**Table 4-28** BGP Peer Information Menu Options (/info/13/bgp))

---

#### Command Syntax and Usage

---

##### **peer**

Displays BGP peer information. See [page 103](#) for a sample output.

---

##### **summary**

Displays peer summary information such as AS, message received, message sent, up/down, state. See [page 103](#) for a sample output.

---

##### **dump**

Displays the BGP routing table. See [page 104](#) for a sample output.

---

## **/info/13/bgp/peer**

### **BGP Peer information**

Following is an example of the information that `/info/13/bgp/peer` provides.

```
BGP Peer Information:

3: 2.1.1.1          , version 0, TTL 1
  Remote AS: 0, Local AS: 0, Link type: IBGP
  Remote router ID: 0.0.0.0,   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: 0, Holdtime: 0, MinAdvTime: 60
  LastErrorCode: unknown(0), LastErrorSubcode: unspecified(0)
  Established state transitions: 0

4: 2.1.1.4          , version 0, TTL 1
  Remote AS: 0, Local AS: 0, Link type: IBGP
  Remote router ID: 0.0.0.0,   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: 0, Holdtime: 0, MinAdvTime: 60
  LastErrorCode: unknown(0), LastErrorSubcode: unspecified(0)
  Established state transitions: 0
```

## **/info/13/bgp/summary**

### **BGP Summary information**

Following is an example of the information that `/info/13/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/13/bgp/dump**

## Show all BGP Information

Following is an example of the information that /info/13/bgp/dump provides.

```
>> BGP# dump
Status codes: * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
  Network          Next Hop          Metr  LcPrf  Wght  Path
  -----
*> 10.0.0.0        205.178.21.147    1      256 147 148 i
*>i205.178.15.0    0.0.0.0           0      0 i
*                  205.178.21.147    1      128 147 i
*> 205.178.17.0    205.178.21.147    1      128 147 i
  13.0.0.0         205.178.21.147    1      256 147 {35} ?

The 13.0.0.0 is filtered out by rrmapi 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 4-29** OSPF Information Menu options (/info/l3/ospf)

---

#### Command Syntax and Usage

---

##### **general**

Displays general OSPF information. See [page 106](#) 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 [1-128]>

Displays interface information for a particular interface. If no parameter is supplied, it displays information for all the interfaces. See [page 107](#) 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 107](#).

---

##### **sumaddr** <area index [0-2]>

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

---

##### **nsumadd** <area index [0-2]>

Displays the list of summary ranges belonging to NSSA areas.

---

##### **routes**

Displays OSPF routing table. See [page 109](#) for a sample output.

---

**Table 4-29** OSPF Information Menu options (/info/l3/ospf)**Command Syntax and Usage****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 ASEextern : 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** 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,
    Poll interval 0, Transit delay 1
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 4-30** OSPF Database Information Menu Options (/info/l3/ospf/dbase)

---

### 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:

- a) `asbrsum adv-rtr 20.1.1.1` displays ASBR summary LSAs having the advertising router 20.1.1.1.
  - b) `asbrsum link_state_id 10.1.1.1` displays ASBR summary LSAs having the link state ID 10.1.1.1.
  - c) `asbrsum self` displays the self advertised ASBR summary LSAs.
  - d) `asbrsum` with no parameters displays all the ASBR summary LSAs.
-

**Table 4-30** OSPF Database Information Menu Options (/info/l3/ospf/dbase)

---

**Command Syntax and Usage**

---

**dbsumm**

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

- a) the number of LSAs of each type in each area.
- b) the total number of LSAs for each area.
- c) the total number of LSAs for each LSA type for all areas combined.
- d) the 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 Information Route Codes

```
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/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 4-31** RIP Information Menu Options (`/info/l3/rip`)

---

### Command Syntax and Usage

---

#### **routes**

Displays RIP routes. For more information, see [page 110](#).

---

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

Displays RIP user's configuration. For more information, see [page 111](#).

---

## `/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>*  
Show RIP User Configuration

```
RIP USER CONFIGURATION :
  RIP on updat 30
  RIP Interface 2 : 102.1.1.1,          enabled
    version 2, listen enabled, supply enabled, default none
    poison disabled, trigg enabled, mcast enabled, metric 1
    auth none,key none
  RIP Interface 3 : 103.1.1.1,          enabled
    version 2, listen enabled, supply enabled, default none
    poison disabled, trigg enabled, mcast enabled, metric 1
```

## `/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
128: 10.90.90.97    255.255.255.0    10.90.90.255,   vlan 4095, up

Default gateway information: metric strict
  1: 10.200.1.1,    vlan any, up

Current BOOTP relay settings: OFF
  0.0.0.0, 0.0.0.0

Current IP forwarding settings: ON, dirbr disabled, noicmpd disabled

Current network filter settings:
  none

Current route map settings:

```

IP information includes:

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



## **/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 4-32** describes the commands used to display information about IGMP groups learned by the switch.

**Table 4-32** IGMP Multicast Group Information Menu Options (/info/l3/igmp)

---

#### **Command Syntax and Usage**

---

##### **mrouter**

Displays IGMP Multicast Router menu. To view menu options, see [page 114](#).

---

##### **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 Group 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.

---

## info/13/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	EXT4	V3	INC	4:16	Yes	
10.1.1.5	232.1.1.1	2	EXT4	V3	INC	4:16	Yes	
*	232.1.1.1	2	EXT4	V3	INC	-	No	
10.10.10.43	235.0.0.1	9	EXT1	V3	INC	2:26	Yes	
*	236.0.0.1	9	EXT1	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/13/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 4-33 describes the commands used to display information about multicast routers (Mrouter) learned through IGMP Snooping.

**Table 4-33** IGMP Mrouter Information Menu Options (/info/igmp/mrouter)

---

#### 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/13/igmp/mrouter/dump` IGMP Mrouter Information

VLAN	Port	Version	Expires	Max Query Resp. Time	QRV	QQIC
-----	-----	-----	-----	-----	----	---
1	EXT1	V3	4:09	128	2	125
2	EXT3	V2	4:09	125	-	-
3	EXT4	V2	static	unknown	-	-

IGMP Mrouter information includes:

- 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/13/vrrp` VRRP Information

Virtual Router Redundancy Protocol (VRRP) support on GbE Switch Module 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, server
 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, proxy
```

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.
- Server status. The `server` state identifies virtual routers.
- Proxy status. The proxy state identifies virtual proxy routers, where the virtual router shares the same IP address as a proxy IP address. The use of virtual proxy routers enables redundant switches to share the same IP address, minimizing the number of unique IP addresses that must be configured.

## `/info/qos` Quality of Service Information

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

**Table 4-34** QoS Menu Options (`/info/qos`)

---

### Command Syntax and Usage

---

#### **8021p**

Displays the 802.1p Information Menu. For details, see [page 117](#).

---

## `/info/qos/8021p` 802.1p Information

```
Current priority to COS queue information:
```

```
Priority  COSq  Weight
```

```
-----  -----  -----
  0         0         1
  1         0         1
  2         0         1
  3         0         1
  4         1         2
  5         1         2
  6         1         2
  7         1         2
```

```
Current port priority information:
```

```
Port      Priority  COSq  Weight
```

```
-----  -----  -----  -----
INT1         0         0         1
INT2         0         0         1
...
MGT          0         0         1
EXT1         0         0         1
EXT2         0         0         1
EXT3         0         0         1
EXT4         0         0         1
```

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

**Table 4-35** 802.1p Priority-to-COS Queue Parameter Descriptions

<b>Parameter</b>	<b>Description</b>
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 4-36** 802.1p Port Priority Parameter Descriptions

<b>Parameter</b>	<b>Description</b>
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

```

Current ACL information:
-----
Filter 2 profile:
Ethernet
  - VID          : 2/0xffff
Meter
  - Set to disabled
  - Set committed rate : 64
  - Set max burst size : 32
Re-Mark
  - Set use of TOS precedence to disabled
Actions          : Permit
No ACL groups configured.

```

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

**Table 4-37** ACL Parameter Descriptions

Parameter	Description
Filter x profile	Indicates the ACL number.
Meter	Displays the ACL meter parameters.
Re-Mark	Displays the ACL re-mark parameters.
Actions	Displays the configured action for the ACL.

## `/info/link` Link Status Information

Alias	Port	Speed	Duplex	Flow Ctrl		Link
----	----	-----	-----	--TX--	--RX--	-----
INT1	1	1000	full	yes	yes	up
INT2	2	1000	full	yes	yes	up
INT3	3	1000	full	yes	yes	up
INT4	4	1000	full	yes	yes	up
INT5	5	1000	full	yes	yes	down
INT6	6	1000	full	yes	yes	up
INT7	7	1000	full	yes	yes	up
INT8	8	1000	full	yes	yes	up
INT9	9	1000	full	yes	yes	up
INT10	10	1000	full	yes	yes	up
INT11	11	1000	full	yes	yes	up
INT12	12	1000	full	yes	yes	up
INT13	13	1000	full	yes	yes	up
INT14	14	1000	full	yes	yes	up
MGT	15	100	full	yes	yes	up
EXT1	17	10000	any	yes	yes	up
EXT2	18	10000	any	yes	yes	up
EXT3	19	10000	any	yes	yes	up
EXT4	20	1000	any	yes	yes	up

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

Use this command to display link status information about each port on an GbE Switch Module slot, including:

- Port alias and number
- Port speed (10, 100, 1000, or 10000)
- Duplex mode (half, full, or any)
- Flow control for transmit and receive (no or yes)
- Link status (up, down, or disabled)



## /info/port

# Port Information

```
>> /info/port
```

Alias	Port	Tag	Fast	Lrn	Fld	PVID	NAME	VLAN(s)
INT1	1	y	n	e	e	1	INT1	1 4095
INT2	2	y	n	e	e	1	INT2	1 4095
INT3	3	y	n	e	e	1	INT3	1 4095
INT4	4	y	n	e	e	1	INT4	1 4095
INT5	5	y	n	e	e	1	INT5	1 4095
INT6	6	y	n	e	e	1	INT6	1 4095
INT7	7	y	n	e	e	1	INT7	1 4095
INT8	8	y	n	e	e	1	INT8	1 4095
INT9	9	y	n	e	e	1	INT9	1 4095
INT10	10	y	n	e	e	1	INT10	1 4095
INT11	11	y	n	e	e	1	INT11	1 4095
INT12	12	y	n	e	e	1	INT12	1 4095
INT13	13	y	n	e	e	1	INT13	1 4095
INT14	14	y	n	e	e	1	INT14	1 4095
MGT	15	y	n	e	e	4095*	MGT	4095
EXT1	17	n	n	e	e	1	EXT1	1
EXT2	18	n	n	e	e	1	EXT2	1
EXT3	19	y	n	e	e	1	EXT3	1 ^10
EXT4	20	y	n	e	e	1	EXT4	1 ^30

^ = Dynamic port in this VLAN  
\* = PVID is tagged.

**NOTE** – The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

Port information includes:

- Port alias and number
- Whether the port uses VLAN tagging or not (y or n)
- Whether the port is configured for Port Fast Forwarding (**Fast**)
- Whether the port is enabled for FDB Learning (**Lrn**)
- Whether the port is enabled for flooding of unknown destination MACs (**Fld**)
- Port VLAN ID (**PVID**)
- Port name
- VLAN membership

## `/info/transcvr` Fiber Port Transceiver Status

---

Port	Device	TX-Enable	RX-Signal	TX-Fault	
19 - EXT3	SR-XFP	enabled	LOST	N/A	<= XFP NOT APPROVED
20 - EXT4	CU-SFP	enabled	N/A	none	

This command displays the status of the Small Form Pluggable (SFP) transceiver module on each Fiber External Port.

## `/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
clrports  - Clear stats for all ports
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
dump      - Dump all stats
```

The information provided by each menu option is briefly described in [Table 5-1](#), with pointers to detailed information.

**Table 5-1** Statistics Menu Options (/stats)

---

**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 127](#).

---

**clrports**

Clears statistics counters for all ports.

---

**l2**

Displays the Layer 2 Stats Menu. To view menu options, see [page 139](#).

---

**l3**

Displays the Layer 3 Stats Menu. To view menu options, see [page 144](#).

---

**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 164](#).

---

**acl**

Displays ACL Statistics menu. To view menu options, see [page 168](#).

---

**snmp**

Displays SNMP statistics. See [page 169](#) for sample output.

---

**ntp [clear]**

Displays Network Time Protocol (NTP) Statistics. See [page 173](#) for a sample output and a description of NTP Statistics.

Use the following command to clear all NTP statistics: `ntp clear`

---

**clrmp**

Clears all management processor statistics.

---

**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 174](#).

---

## `/stats/port` <*port alias or number*> **Port Statistics**

This menu displays 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
 brg     - Show bridging ("dot1") stats
 ether   - Show Ethernet ("dot3") stats
 if      - Show interface ("if") stats
 ip      - Show Internet Protocol ("IP") stats
 link    - Show link stats
 clear   - Clear all port stats
```

**Table 5-2** Port Statistics Menu Options (`/stats/port`)

### Command Syntax and Usage

#### **8021x**

Displays IEEE 802.1x statistics for the port. See [page 129](#) for sample output.

#### **brg**

Displays bridging ("dot1") statistics for the port. See [page 131](#) for sample output.

#### **ether**

Displays Ethernet ("dot3") statistics for the port. See [page 133](#) for sample output.

#### **if**

Displays interface statistics for the port. See [page 136](#) for sample output.

#### **ip**

Displays IP statistics for the port. See [page 138](#) for sample output.

#### **link**

Displays link statistics for the port. See [page 138](#) for sample output.

#### **clear**

This command clears all the statistics on the port.

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

This menu option enables you to display 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 5-3** 802.1x Authenticator Statistics of a Port (`/stats/port/8021x`)

Statistics	Description
<code>eapolFramesRx</code>	Total number of EAPOL frames received
<code>eapolFramesTx</code>	Total number of EAPOL frames transmitted
<code>eapolStartFramesRx</code>	Total number of EAPOL Start frames received
<code>eapolLogoff-FramesRx</code>	Total number of EAPOL Logoff frames received
<code>eapolRespId-FramesRx</code>	Total number of EAPOL Response Identity frames received
<code>eapolRespFramesRx</code>	Total number of Response frames received
<code>eapolReqIdFramesTx</code>	Total number of Request Identity frames transmitted
<code>eapolReqFramesTx</code>	Total number of Request frames transmitted
<code>invalidEapol-FramesRx</code>	Total number of invalid EAPOL frames received
<code>eapLengthError-FramesRx</code>	Total number of EAP length error frames received
<code>lastEapolFrameVer-sion</code>	The protocol version number carried in the most recently received EAPOL frame.
<code>lastEapolFrame-Source</code>	The source MAC address carried in the most recently received EAPOL frame.

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

This menu option enables you to display 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 5-4** 802.1x Authenticator Diagnostics of a Port (`/stats/port/8021x`)

Statistics	Description
<code>authEntersConnecting</code>	Total number of times that the state machine transitions to the CONNECTING state from any other state.
<code>authEapLogoffsWhileConnecting</code>	Total number of times that the state machine transitions from CONNECTING to DISCONNECTED as a result of receiving an EAPOL-Logoff message.
<code>authEntersAuthenticating</code>	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.
<code>authSuccessesWhileAuthenticating</code>	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.

**Table 5-4** 802.1x Authenticator Diagnostics of a Port (/stats/port/8021x)

Statistics	Description
authTimeoutsWhileAuthenticating	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.
authFailWhileAuthenticating	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.
authReauthsWhileAuthenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of a re-authentication request
authEapStartsWhileAuthenticating	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.
authEapLogoffWhileAuthenticating	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.
authReauthsWhileAuthenticated	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of a re-authentication request.
authEapStartsWhileAuthenticated	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.
authEapLogoffWhileAuthenticated	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.
backendAccessChallenges	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.
backendOtherRequestsToSupplicant	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.
backendNonNakResponsesFromSupplicant	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.



**Table 5-4** 802.1x Authenticator Diagnostics of a Port (/stats/port/8021x)

Statistics	Description
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>* **/brg** **Bridging Statistics**

This menu option enables you to display the bridging statistics of the selected port.

```
Bridging statistics for port INT1:
dot1PortInFrames:           63242584
dot1PortOutFrames:         63277826
dot1PortInDiscards:        0
dot1TpLearnedEntryDiscards: 0
dot1StpPortForwardTransitions: 0
```

**Table 5-5** Bridging Statistics of a Port (/stats/port/brg)

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.

**Table 5-5** Bridging Statistics of a Port (/stats/port/brg)

<b>Statistics</b>	<b>Description</b>
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 menu option enables you to display the ethernet statistics of the selected port

```
Ethernet statistics for port INT1:
dot3StatsAlignmentErrors:                0
dot3StatsFCSErrors:                      0
dot3StatsSingleCollisionFrames:          0
dot3StatsMultipleCollisionFrames:        0
dot3StatsLateCollisions:                 0
dot3StatsExcessiveCollisions:            0
dot3StatsInternalMacTransmitErrors:      NA
dot3StatsFrameTooLongs:                  0
dot3StatsInternalMacReceiveErrors:       0
```

**Table 5-6** Ethernet Statistics for Port (`/stats/port/ether`)

Statistics	Description
<code>dot3StatsAlignmentErrors</code>	<p>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.</p> <p>The count represented by an instance of this object is incremented when the <code>alignmentError</code> 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.</p>
<code>dot3StatsFCSErrors</code>	<p>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.</p> <p>The count represented by an instance of this object is incremented when the <code>frameCheckError</code> 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.</p>
<code>dot3StatsSingleCollisionFrames</code>	<p>A count of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision.</p> <p>A frame that is counted by an instance of this object is also counted by the corresponding instance of either the <code>ifOutUcastPkts</code>, <code>ifOutMulticastPkts</code>, or <code>ifOutBroadcastPkts</code>, and is not counted by the corresponding instance of the <code>dot3StatsMultipleCollisionFrame</code> object.</p>

**Table 5-6** Ethernet Statistics for Port (/stats/port/ether)

<b>Statistics</b>	<b>Description</b>
dot3StatsMultipleCollisionFrames	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.
dot3StatsExcessiveCollisions	A count of frames for which transmission on a particular interface fails due to excessive collisions.
dot3StatsInternalMacTransmitErrors	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.
dot3StatsFrameTooLongs	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.

**Table 5-6** Ethernet Statistics for Port (/stats/port/ether)

Statistics	Description
dot3StatsInternal- MacReceiveErrors	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 dot3Stats-AlignmentErrors 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 menu option enables you to display the interface statistics of the selected port.

Interface statistics for port EXT1:			
	ifHCIn Counters		ifHCOut Counters
Octets:	51697080313		51721056808
UcastPkts:	65356399		65385714
BroadcastPkts:	0		6516
MulticastPkts:	0		0
Discards:	0		0
Errors:	0		21187

**Table 5-7** Interface Statistics for Port (/stats/port/if)

<b>Statistics</b>	<b>Description</b>
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.
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.
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.

**Table 5-7** Interface Statistics for Port (/stats/port/if)

<b>Statistics</b>	<b>Description</b>
<code>ifInUnknownProtos</code>	For packet-oriented interfaces, the number of packets received via the interface which were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces which support protocol multiplexing, the number of transmission units received via the interface which were discarded because of an unknown or unsupported protocol. For any interface which does not support protocol multiplexing, this counter will always be 0.
<code>ifOutOctets</code>	The total number of octets transmitted out of the interface, including framing characters.
<code>ifOutUcastPkts</code>	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.
<code>ifOutBroadcastPkts</code>	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 <code>ifOutBroadcastPkts</code> .
<code>ifOutMulticastPkts</code>	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 <code>ifOutMulticastPkts</code> .
<code>ifOutDiscards</code>	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.
<code>ifOutErrors</code>	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 menu option enables you to display the interface statistics of the selected port.

```
GEA IP statistics for port INT1:
ipInReceives      :      0
ipInHeaderError:  :      0
ipInDiscards     :      0
```

**Table 5-8** Interface Protocol Statistics (`/stats/port/ip`)

Statistics	Description
<code>ipInReceives</code>	The total number of input datagrams received from interfaces, including those received in error.
<code>ipInHeaderErrors</code>	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).
<code>ipInDiscards</code>	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 menu enables you to display the link statistics of the selected port.

```
Link statistics for port INT1:
linkStateChange:      1
```

**Table 5-9** Link Statistics (`/stats/port/link`)

Statistics	Description
<code>linkStateChange</code>	The total number of link state changes.



## /stats/l2

# Layer 2 Statistics

```
[Layer 2 Statistics Menu]
fdb      - Show FDB stats
lACP     - Show LACP stats
gvrp     - GVRP statistics
```

The Layer 2 statistics provided by each menu option are briefly described in [Table 5-10](#), with pointers to detailed information.

**Table 5-10** Layer 2 Statistics Menu Options (/stats/l2)

### Command Syntax and Usage

#### **fdb [clear]**

Displays FDB statistics. See [page 139](#) for sample output.

Use the following command to clear all FDB statistics: `fdb clear`

#### **lACP <port alias or number> [clear]**

Displays Link Aggregation Control Protocol (LACP) statistics. See [page 141](#) for sample output.

Use the following command to clear all LACP statistics: `lACP clear`

#### **gvrp**

Displays Generic VLAN Registration Protocol (GVRP) statistics. See [page 142](#) for sample output.

## /stats/l2/fdb [clear]

# FDB Statistics

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

This menu option enables you to display statistics regarding the use of the forwarding database, including the number of new entries, finds, and unsuccessful searches. Use the following command to clear all FDB statistics: `fdb clear`

FDB statistics are described in the following table:

**Table 5-11** Forwarding Database Statistics (/stats/fdb)

Statistic	Description
current	Current number of entries in the Forwarding Database.

**Table 5-11** Forwarding Database Statistics (/stats/fdb)

<b>Statistic</b>	<b>Description</b>
hiwat	Highest number of entries recorded at any given time in the Forwarding Database.

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

```

Port EXT1:
-----
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 5-12** LACP Statistics (/stats/lacp)

<b>Statistic</b>	<b>Description</b>
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.

## /stats/12/gvrp GVRP Statistics

```
GARP/GVRP statistics
=====
Join Empty received:      3194
Join In received:        492
Empty received:          482
Leave In received:        0
Leave Empty received:     0
Leave All received:      138
Join Empty transmitted:  1461
Join In transmitted:    586
Empty transmitted:      1175
Leave In transmitted:    0
Leave Empty transmitted:  0
Leave All transmitted:   143
Unaccepted Attribute Value: 0
Invalid Message/Attributes: 0
Failure in registration: 0
```

Generic VLAN Registration Protocol (GVRP) statistics are described in the following table:

**Table 5-13** GVRP Statistics (/stats/gvrp)

Statistic	Description
Join Empty received	The total number of Join Empty messages received.
Join In received	The total number of Join In messages received.
Empty received	The total number of Empty messages received.
Leave In received	The total number of Leave In messages received.
Leave Empty received	The total number of Leave Empty messages received.
Leave All received	The total number of Leave All messages received.
Join Empty transmitted	The total number of Join Empty messages sent.
Join In transmitted	The total number of Join In messages sent.
Empty transmitted	The total number of Empty messages sent.
Leave In transmitted	The total number of Leave In messages sent.

**Table 5-13** GVRP Statistics (/stats/gvrp)

<b>Statistic</b>	<b>Description</b>
Leave Empty transmitted	The total number of Leave Empty messages sent.
Leave All transmitted	The total number of LeaveAll messages sent.
Unaccepted Attribute Value	The total number of GPDU's received that had an unacceptable attribute value.
Invalid Message/Attributes	The total number of invalid messages or attributes received, such as the following:  Invalid <b>Protocol ID</b> Invalid <b>Attribute Type</b> Invalid <b>Attribute Length</b> Invalid <b>Attribute Event</b>
Failure in registration	The total number of GVRP registrations that failed. To see more detail about failed registrations, check the syslog.

## /stats/13

# Layer 3 Statistics

```
[Layer 3 Statistics Menu]
geal3      - GEA Layer 3 Stats Menu
ip         - Show IP stats
route     - Show route 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
vrrp    - Show VRRP stats
clrvrrp - Clear 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
ripclear - Clear RIP stats
ospfclear - Clear all OSPF stats
dump    - Dump layer 3 stats
```

The Layer 3 statistics provided by each menu option are briefly described in [Table 5-14](#), with pointers to detailed information.

**Table 5-14** Layer 3 Statistics Menu Options (/stats/13)

---

### 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 147](#) for sample output.

---

#### **route [clear]**

Displays route statistics. See [page 149](#) for sample output.

Use the following command to clear all route statistics: `route clear`

---

#### **arp**

Displays Address Resolution Protocol (ARP) statistics. See [page 149](#) for sample output.

---

**Table 5-14** Layer 3 Statistics Menu Options (/stats/l3)

---

**Command Syntax and Usage**

---

**dns [clear]**

Displays Domain Name System (DNS) statistics. See [page 150](#) for sample output.

Use the following command to clear all DNS statistics: `dns clear`

---

**icmp [clear]**

Displays ICMP statistics. See [page 150](#) for sample output.

Use the following command to clear all ICMP statistics: `icmp clear`

---

**tcp [clear]**

Displays TCP statistics. See [page 153](#) for sample output.

Use the following command to clear all TCP statistics: `tcp clear`

---

**udp [clear]**

Displays UDP statistics. See [page 155](#) for sample output.

Use the following command to clear all UDP statistics: `udp clear`

---

**igmp**

Displays IGMP statistics. See [page 156](#) for sample output.

---

**ospf**

Displays OSPF statistics. See [page 157](#) for sample output.

---

**vrrp**

When virtual routers are configured, you can display protocol statistics for VRRP:

See [page 162](#) for sample output.

---

**clrvrrp**

Clears VRRP statistics.

---

**rip**

Displays Routing Information Protocol (RIP) statistics. See [page 163](#) 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 IP statistics. Use this command with caution as it will delete all the IP statistics.

---

**ripclear**

Clears Routing Information Protocol (RIP) statistics.

---

**Table 5-14** Layer 3 Statistics Menu Options (/stats/l3)

---

**Command Syntax and Usage**

---

**ospfclear**

Clears Open Shortest Path First (OSPF) 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 IP 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 5-15** IP Statistics (stats/l3/ip)

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.
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.

**Table 5-15** IP Statistics (stats/l3/ip)

<b>Statistics</b>	<b>Description</b>
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 <i>no-route</i> 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.
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/route [clear]` Route Statistics

```
Route statistics:
ipRoutesCur:          11  ipRoutesHighWater:    11
ipRoutesMax:          2048
```

**Table 5-16** Route Statistics (`/stats/l3/route`)

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

## `/stats/l3/arp` ARP statistics

This menu option enables you to display Address Resolution Protocol statistics.

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

**Table 5-17** ARP Statistics (`/stats/l3/arp`)

Statistics	Description
<code>arpEntriesCur</code>	The total number of outstanding ARP entries in the ARP table.
<code>arpEntriesHighWater</code>	The highest number of ARP entries ever recorded in the ARP table.

## `/stats/l3/dns [clear]` DNS Statistics

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

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

**Table 5-18** DNS Statistics (`/stats/dns`)

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

## `/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 5-19** ICMP Statistics (`/stats/l3/icmp`)

Statistics	Description
<code>icmpInMsgs</code>	The total number of ICMP messages which the entity (the switch) received. Note that this counter includes all those counted by <code>icmpInErrors</code> .
<code>icmpInErrors</code>	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).

**Table 5-19** ICMP Statistics (/stats/l3/icmp)

<b>Statistics</b>	<b>Description</b>
<code>icmpInDestUnreachs</code>	The number of ICMP Destination Unreachable messages received.
<code>icmpInTimeExcds</code>	The number of ICMP Time Exceeded messages received.
<code>icmpInParmProbs</code>	The number of ICMP Parameter Problem messages received.
<code>icmpInSrcQuenchs</code>	The number of ICMP Source Quench (buffer almost full, stop sending data) messages received.
<code>icmpInRedirects</code>	The number of ICMP Redirect messages received.
<code>icmpInEchos</code>	The number of ICMP Echo (request) messages received.
<code>icmpInEchoReps</code>	The number of ICMP Echo Reply messages received.
<code>icmpInTimestamps</code>	The number of ICMP Timestamp (request) messages received.
<code>icmpInTimestampReps</code>	The number of ICMP Timestamp Reply messages received.
<code>icmpInAddrMasks</code>	The number of ICMP Address Mask Request messages received.
<code>icmpInAddrMaskReps</code>	The number of ICMP Address Mask Reply messages received.
<code>icmpOutMsgs</code>	The total number of ICMP messages which this entity (the switch) attempted to send. Note that this counter includes all those counted by <code>icmpOutErrors</code> .
<code>icmpOutErrors</code>	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.
<code>icmpOutDestUnreachs</code>	The number of ICMP Destination Unreachable messages sent.
<code>icmpOutTimeExcds</code>	The number of ICMP Time Exceeded messages sent.
<code>icmpOutParmProbs</code>	The number of ICMP Parameter Problem messages sent.
<code>icmpOutSrcQuenchs</code>	The number of ICMP Source Quench (buffer almost full, stop sending data) messages sent.
<code>icmpOutRedirects</code>	The number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.
<code>icmpOutEchos</code>	The number of ICMP Echo (request) messages sent.
<code>icmpOutEchoReps</code>	The number of ICMP Echo Reply messages sent.

**Table 5-19** ICMP Statistics (/stats/l3/icmp)

<b>Statistics</b>	<b>Description</b>
<code>icmpOutTimestamps</code>	The number of ICMP Timestamp (request) messages sent.
<code>icmpOutTimestampReps</code>	The number of ICMP Timestamp Reply messages sent.
<code>icmpOutAddrMasks</code>	The number of ICMP Address Mask Request messages sent.
<code>icmpOutAddrMaskReps</code>	The number of ICMP Address Mask Reply messages sent.

## /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 5-20** TCP Statistics (/stats/l3/tcp)

Statistics	Description
tcpRtoAlgorithm	The algorithm used to determine the <code>timeout</code> value used for retransmitting unacknowledged octets.
tcpRtoMin	The minimum value permitted by a TCP implementation for the retransmission <code>timeout</code> , measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission <code>timeout</code> . In particular, when the <code>timeout</code> algorithm is <code>rsre(3)</code> , an object of this type has the semantics of the <code>LBOUND</code> quantity described in RFC 793.
tcpRtoMax	The maximum value permitted by a TCP implementation for the retransmission <code>timeout</code> , measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission <code>timeout</code> . In particular, when the <code>timeout</code> algorithm is <code>rsre(3)</code> , an object of this type has the semantics of the <code>UBOUND</code> 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 <code>SYN-SENT</code> state from the <code>CLOSED</code> state.
tcpPassiveOpens	The number of times TCP connections have made a direct transition to the <code>SYN-RCVD</code> state from the <code>LISTEN</code> state.
tcpAttemptFails	The number of times TCP connections have made a direct transition to the <code>CLOSED</code> state from either the <code>SYN-SENT</code> state or the <code>SYN-RCVD</code> state, plus the number of times TCP connections have made a direct transition to the <code>LISTEN</code> state from the <code>SYN-RCVD</code> state.

**Table 5-20** TCP Statistics (/stats/l3/tcp)

<b>Statistics</b>	<b>Description</b>
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.



## `/stats/l3/udp [clear]` UDP Statistics

```

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

```

**Table 5-21** UDP Statistics (`/stats/l3/udp`)

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

## `/stats/l3/igmp <VLAN number>` IGMP Statistics

```

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

```

This menu option displays statistics about the use of the IGMP Multicast Groups. IGMP statistics are described in the following table:

**Table 5-22** IGMP Statistics (`/stats/l3/igmp`)

Statistic	Description
<code>rxIgmpValidPkts</code>	Total number of valid IGMP packets received
<code>rxIgmpInvalidPkts</code>	Total number of invalid packets received
<code>rxIgmpGenQueries</code>	Total number of General Membership Query packets received
<code>rxIgmpGrpSpecificQueries</code>	Total number of Membership Query packets received from specific groups
<code>rxIgmpGroupSrcSpecificQueries</code>	Total number of Group Source-Specific Queries (GSSQ) received
<code>rxIgmpLeaves</code>	Total number of Leave requests received
<code>rxIgmpReports</code>	Total number of Membership Reports received
<code>txIgmpReports</code>	Total number of Membership reports transmitted
<code>txIgmpGrpSpecificQueries</code>	Total number of Membership Query packets transmitted to specific groups
<code>txIgmpLeaves</code>	Total number of Leave messages transmitted
<code>rxIgmpV3CurrentStateRecords</code>	Total number of Current State records received
<code>rxIgmpV3SourceListChangeRecords</code>	Total number of Source List Change records received.
<code>rxIgmpV3FilterChangeRecords</code>	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 5-23** OSPF Statistics Menu (/stats/l3/ospf)

---

#### Command Syntax and Usage

---

##### **general**

Displays global statistics. See [page 158](#) for sample output.

---

##### **aindex**

Displays area statistics.

---

##### **if**

Displays interface statistics.

---

**/stats/l3/ospf/general****OSPF Global 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:
hello                   2
start                   0
n2way                   2
adjoint ok              2
negotiation done       2
exchange done           2
bad requests            0
bad sequence            0
loading done            2
nlway                   0
rst_ad                  0
down                    1

Intf change Stats:
hello                   4
down                    2
loop                    0
unloop                  0
wait timer              2
backup                  0
nbr change              5

Timers kickoff
hello                   514
retransmit              1028
lsa lock                 0
lsa ack                  0
dbage                    0
summary                  0
ase export               0

```

**Table 5-24** OSPF General Statistics (stats/l3/ospf/general)

<b>Statistics</b>	<b>Description</b>
<b>Rx/Tx Stats:</b>	
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.

**Table 5-24 OSPF General Statistics (stats/l3/ospf/general) (Continued)**

<b>Statistics</b>	<b>Description</b>
<b>Nbr Change Stats:</b>	
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 <code>HelloInterval</code> seconds.) across all OSPF areas and interfaces.
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: <ul style="list-style-type: none"> <li>a) Has an unexpected DD sequence number</li> <li>b) Unexpectedly has the init bit set</li> <li>c) Has an options field differing from the last Options field received in a Database Description packet.</li> </ul> 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 5-24** OSPF General Statistics (stats/l3/ospf/general) (Continued)

<b>Statistics</b>	<b>Description</b>
<b>Intf Change Stats:</b>	
hello	The sum total number of Hello packets sent on all interfaces and 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.
<b>Timers Kickoff:</b>	
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/vrrp VRRP Statistics

Virtual Router Redundancy Protocol (VRRP) support on the GbE Switch Module 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 protocol statistics for VRRP:

The statistics for the VRRP LAN are displayed:

VRRP statistics:			
vrrpInAdvers:	0	vrrpBadAdvers:	0
vrrpOutAdvers:	0		
vrrpBadVersion:	0	vrrpBadVrid:	0
vrrpBadAddress:	0	vrrpBadData:	0
vrrpBadPassword:	0	vrrpBadInterval:	0

**Table 5-25** VRRP Statistics (/stats/l3/vrrp)

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/13/rip` Routing Information Protocol Statistics

```
RIP ALL STATS INFORMATION:
  RIP packets received = 12
  RIP packets sent     = 75
  RIP request received = 0
  RIP response received = 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

---

```
[MP-specific Statistics Menu]
pkt      - Show Packet stats
tcb      - Show All TCP control blocks in use
ucb      - Show All UDP control blocks in use
cpu      - Show CPU utilization
```

---

**Table 5-26** Management Processor Statistics Menu Options (`/stats/mp`)

---

### Command Syntax and Usage

---

#### **pkt**

Displays packet statistics, to check for leads and load. To view a sample output and a description of the stats, see [page 165](#).

---

#### **tcb**

Displays all TCP control blocks that are in use. To view a sample output and a description of the stats, see [page 166](#).

---

#### **ucb**

Displays all UDP control blocks that are in use. To view a sample output, see [page 167](#).

---

#### **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 167](#).

---

## /stats/mp/pkt

### MP Packet Statistics

Packet counts:			
allocs:	1722684	frees:	1722684
mediums:	0	mediums hi-watermark:	4
jumbos:	0	jumbos hi-watermark:	0
smalls:	0	smalls hi-watermark:	8
failures:	0		

**Table 5-27** Packet Statistics (/stats/mp/pkt)

Statistics	Description
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.
mediums	Total number of packet allocations with size between 128 to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
mediums 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.
jumbos	Total number of packet allocations with more than 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
jumbos hi-watermark	The highest number of packet allocation with more than 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
smalls	Total number of packet allocations with size less than 128 bytes from the packet buffer pool by the TCP/IP protocol stack.
smalls 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.
failures	Total number of packet allocation failures 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 5-28** MP Specified TCP Statistics (`/stats/mp/tcb`)

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 menu option enables you to display the CPU utilization statistics.

```
CPU utilization:
cpuUtil1Second:      53%
cpuUtil4Seconds:    54%
cpuUtil64Seconds:   54%
```

**Table 5-29** CPU Statistics (stats/mp/cpu)

<b>Statistics</b>	<b>Description</b>
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**

[ACL Menu]	
acl	- Display ACL stats
dump	- Display all available ACL stats
clracl	- Clear ACL stats

ACL statistics are described in the following table.

**Table 5-30** ACL Statistics Menu Options (/stats/acl)

---

### **Command Syntax and Usage**

---

**acl** <I-896>

Displays the Access Control List Statistics for a specific ACL. For details, see [page 168](#).

**dump**

Displays all ACL statistics.

**clracl**

Clears all ACL statistics.

---

## **/stats/acl/acl** <ACL number>

# **ACL Statistics**

This option displays ACL statistics.

Hits for ACL 1, port EXT1:	26057515
Hits for ACL 2, port EXT1:	26057497

## /stats/snmp

# SNMP Statistics

**NOTE** – Use the following command to reset the SNMP counter to zero: `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 5-31** SNMP Statistics (/stats/snmp)

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 5-31** SNMP Statistics (/stats/snmp)

Statistics	Description
snmpInASNParseErrs	The total number of ASN.1 or BER errors encountered by the SNMP protocol entity when decoding SNMP Messages received. <b>Note:</b> 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.
snmpEnableAuthTraps	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.
snmpInTooBig	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 <i>too big</i> .
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 <i>noSuchName</i> .
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 <i>badValue</i> .
snmpInReadOnly	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 <i>'read-Only'</i> . It should be noted that it is a protocol error to generate an SNMP PDU, which contains the value <i>'read-Only'</i> 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 <i>genErr</i> .
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).



**Table 5-31** SNMP Statistics (/stats/snmp)

<b>Statistics</b>	<b>Description</b>
<code>snmpInTotalSetVars</code>	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).
<code>snmpInGetRequests</code>	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
<code>snmpInGetNexts</code>	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
<code>snmpInSetRequests</code>	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
<code>snmpInGetResponses</code>	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
<code>snmpInTraps</code>	The total number of SNMP Trap Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
<code>snmpOutTooBigs</code>	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 <i>too big</i> .
<code>snmpOutNoSuchNames</code>	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 <code>noSuchName</code> .
<code>snmpOutBadValues</code>	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 <code>badValue</code> .
<code>snmpOutReadOnlys</code>	Not in use.
<code>snmpOutGenErrs</code>	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 <code>genErr</code> .
<code>snmpOutGetRequests</code>	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
<code>snmpOutGetNexts</code>	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
<code>snmpOutSetRequests</code>	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
<code>snmpOutGetResponses</code>	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.

**Table 5-31** SNMP Statistics (/stats/snmp)

<b>Statistics</b>	<b>Description</b>
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 [clear]

# NTP Statistics

Alteon OS 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.

Use the following command to clear all NTP statistics: `ntp clear`

```
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 server.
Last update time: 18:04:16 Tue Jul 17, 2007
Current system time: 18:55:49 Tue Jul 17, 2007
```

**Table 5-32** NTP Statistics Parameters (/stats/ntp)

Field	Description
Primary Server	<p><b>Requests Sent:</b> The total number of NTP requests the switch sent to the primary NTP server to synchronize time.</p> <p><b>Responses Received:</b> The total number of NTP responses received from the primary NTP server.</p> <p><b>Updates:</b> The total number of times the switch updated its time based on the NTP responses received from the primary NTP server.</p>
Secondary Server	<p><b>Requests Sent:</b> The total number of NTP requests the switch sent to the secondary NTP server to synchronize time.</p> <p><b>Responses Received:</b> The total number of NTP responses received from the secondary NTP server.</p> <p><b>Updates:</b> The total number of times the switch updated its time based on the NTP responses received from the secondary NTP server.</p>

**Table 5-32** NTP Statistics Parameters (/stats/ntp)

<b>Field</b>	<b>Description</b>
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 command <code>/stats/ntp</code> was issued.

## `/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
  pmirr    - Port Mirroring Menu
  l2       - Layer 2 Menu
  l3       - Layer 3 Menu
  qos      - QOS Menu
  acl      - Access Control List 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 6-1](#), with pointers to detailed menu commands.

**Table 6-1** Configuration Menu Options (/cfg)

---

### Command Syntax and Usage

---

#### **sys**

Displays the System Configuration Menu. To view menu options, see [page 179](#).

---

#### **port** <port alias or number>

Displays the Port Configuration Menu. To view menu options, see [page 213](#).

---

#### **pmirr**

Displays the Mirroring Configuration Menu. To view menu options, see [page 324](#).

---

#### **l2**

Displays the Layer 2 Configuration Menu. To view menu options, see [page 217](#).

---

#### **l3**

Displays the Layer 3 Configuration Menu. To view menu options, see [page 253](#).

---

#### **qos**

Displays the Quality of Service Configuration Menu. To view menu options, see [page 309](#).

---

#### **acl**

Displays the ACL Configuration Menu. To view menu options, see [page 312](#).

---

#### **setup**

Step-by-step configuration set-up of the switch. For details, see [page 326](#).

---

**Table 6-1** Configuration Menu Options (/cfg)

---

**Command Syntax and Usage**

---

**dump**

Dumps current configuration to a script file. For details, see [page 326](#).

---

**ptcfg** *<host name or IP address of TFTP server>* *<filename on host>*

Backs up current configuration to TFTP server. For details, see [page 327](#).

---

**gtcfg** *<host name or IP address of TFTP server>* *<filename on host>*

Restores current configuration from TFTP server. For details, see [page 327](#).

---

**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 or on the management module. 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 GbE Switch Module.

---

**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 346](#).



## /cfg/sys

# System Configuration

```
[System 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
  date   - Set system date
  time   - Set system time
  timezone - Set system timezone (daylight savings)
  olddst - Set system DST for US
  dlight - Set system daylight savings
  idle   - Set timeout for idle CLI sessions
  notice - Set login notice
  bannr  - Set login banner
  hprompt - Enable/disable display hostname (sysName) in CLI prompt
  reminder - Enable/disable Reminders
  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 6-2** System Configuration Menu Options (/cfg/sys)

---

### Command Syntax and Usage

---

#### **syslog**

Displays the Syslog Menu. To view menu options, see [page 182](#).

---

#### **sshd**

Displays the SSH Server Menu. To view menu options, see [page 183](#).

---

#### **radius**

Displays the RADIUS Authentication Menu. To view menu options, see [page 185](#).

---

#### **tacacs+**

Displays the TACACS+ Authentication Menu. To view menu options, see [page 187](#).

---

#### **ldap**

Displays the LDAP Authentication Menu. To view menu options, see [page 190](#).

---

**Table 6-2** System Configuration Menu Options (/cfg/sys)

---

**Command Syntax and Usage**

---

**ntp**

Displays the Network Time Protocol (NTP) Server Menu. To view menu options, see [page 192](#).

---

**ssnmp**

Displays the System SNMP Menu. To view menu options, see [page 193](#).

---

**access**

Displays the System Access Menu. To view menu options, see [page 206](#).

---

**date**

Prompts the user for the system date. The date reverts to its default value when the switch is reset.

---

**time**

Configures the system time using a 24-hour clock format. The time reverts to its default 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.

---

**olddst enable|disable**

Enables or disables use of the Daylight Saving Time (DST) rules in effect prior to the year 2007. The default value is **disabled**.

---

**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 5 minutes.

---

**notice** *<max 1024 char 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).

---

**Table 6-2** System Configuration Menu Options (/cfg/sys)

---

**Command Syntax and Usage**

---

**reminder disable | enable**

Enables or disables reminder messages in the CLI. The default value is enabled.

**cur**Displays the current system parameters.

---

## /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 6-3** Host Log Menu Options (/cfg/sys/syslog)

---

#### Command Syntax and Usage

---

**host** <new syslog host IP address (such as, 192.4.17.223)>

Sets the IP address of the first syslog host.

---

**host2** <new syslog host IP address (such as, 192.4.17.223)>

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.

---

**log** <feature | all> <enable | disable>

Displays a list of features for which syslog messages can be generated. You can choose to enable/disable specific features (such as vlans, stg, or servers), or enable/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
```

For the GbE Switch Module, this menu enables Secure Shell access from any SSH client. SSH scripts can be viewed by using the `/cfg/dump` command (see [page 326](#)).

**Table 6-4** System Configuration Menu Options (`/cfg/sys/sshd`)

---

#### Command Syntax and Usage

---

##### **intrval** <0 - 24>

Set the interval 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.

---

##### **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.

---

**Table 6-4** System Configuration Menu Options (/cfg/sys/sshd)

---

**Command Syntax and Usage**

---

**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
  telnet - Enable or disable RADIUS backdoor for telnet
  on - Turn RADIUS authentication ON
  off - Turn RADIUS authentication OFF
  cur - Display current RADIUS configuration
```

**Table 6-5** System Configuration Menu Options (/cfg/sys/radius)

---

### 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 configure, default 1645>

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.

---

**telnet disable|enable**

Enables or disables the RADIUS backdoor for telnet. The `telnet` command also applies to SSH/SCP connections and the Browser-Based Interface (BBI). The default is `disabled`.

To obtain the RADIUS backdoor password for your GbESM, contact your IBM Service and Support line.

---

**on**

Enables the RADIUS server.

---

**Table 6-5** System Configuration Menu Options (/cfg/sys/radius)

---

**Command Syntax and Usage**

---

**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 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
  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
  timeout  - Set timeout value of TACACS+ server retries
  telnet   - Enable/disable TACACS+ backdoor for telnet/ssh/http
  secbd    - Enable/disable TACACS+ secure backdoor for telnet/
             ssh/http
  cmap     - Enable/disable TACACS+ new privilege level mapping
  passch   - Enable/disable TACACS+ password change
  chpass_p - Set new password for primary server
  chpass_s - Set new password for secondary server
  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 6-6** TACACS+ Server Menu Options (/cfg/sys/tacacs)

---

**Command Syntax and Usage**

---

**prisrv** <IP address>

Defines the primary TACACS+ server address.

**secsrv** <IP address>

Defines the secondary TACACS+ server address.

**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 configure, default 49>

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.

**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.

**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 is disabled.

To obtain the TACACS+ backdoor password for your GbESM, contact your IBM 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 is disabled.

**cmmap enable|disable**

Enables or disables TACACS+ privilege-level mapping.

The default value is disabled.

**Table 6-6** TACACS+ Server Menu Options (/cfg/sys/tacacs)

---

**Command Syntax and Usage**

---

**passch enable | disable**

Enables or disables TACACS+ password change.

The default value is disabled.

---

**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.

---

**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.

---

**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
  telnet   - Enable/disable LDAP backdoor for telnet/ssh/http
  on       - Enable LDAP authentication
  off      - Disable LDAP authentication
  cur      - Display current LDAP settings
```

**Table 6-7** LDAP Server Menu Options (/cfg/sys/ldap)

---

#### 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 configure, default 389>

Enter the number of the TCP port to be configured, between 1 - 65000. The default is 389.

---

**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

---

**Table 6-7** LDAP Server Menu Options (/cfg/sys/ldap)

---

**Command Syntax and Usage**

---

**telnet disable | enable**

Enables or disables the LDAP back door for telnet. The `telnet` command also applies to SSH/SCP connections, and the Browser-Based Interface (BBI). The default is `disabled`.

To obtain the LDAP backdoor password for your GbESM, contact your IBM 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 address
  secsrv - Set secondary NTP server 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 6-8** NTP Configuration Menu Options (/cfg/sys/ntp)

---

#### Command Syntax and Usage

---

**prisrv** <NTP Server IP address>

Prompts for the IP addresses of the primary NTP server to which you want to synchronize the switch clock.

**secsrv** <NTP Server IP address>

Prompts for the IP addresses of the secondary NTP server to which you want to synchronize the switch clock.

**intrval** <resync interval in minutes>

Specifies the interval, that is, how often, in minutes (1-2880), to re-synchronize the switch clock with the NTP server.

**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
  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
```

Alteon OS 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 6-9** System SNMP Menu Options (/cfg/sys/ssnmp)

---

**Command Syntax and Usage**

---

**snmpv3**

Displays SNMPv3 menu. To view menu options, see [page 195](#).

---

**name** <new string, maximum 64 characters>

Configures the name for the system. The name can have a maximum of 64 characters.

---

**locn** <new string, maximum 64 characters>

Configures the name of the system location. The location can have a maximum of 64 characters.

---

**cont** <new string, maximum 64 characters>

Configures the name of the system contact. The contact can have a maximum of 64 characters.

---

**rcomm** <new SNMP read community string, maximum 32 characters>

Configures the SNMP read community string. The read community string controls SNMP “get” access to the switch. It can have a maximum of 32 characters. The default read community string is *public*.

---

**wcomm** <new SNMP write community string, maximum 32 characters>

Configures the SNMP write community string. The write community string controls SNMP “set” and “get” access to the switch. It can have a maximum of 32 characters. The default write community string is *private*.

---

**trsrc** <1-128>

Configures the source interface for SNMP traps.

---

**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 RFC2271 to RFC2276.

```
[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
  vlw2     - Enable/disable V1/V2 access
  cur      - Display current SNMPv3 configuration
```

**Table 6-10** SNMPv3 Configuration Menu Options (/cfg/sys/ssnmp/snmpv3)

---

### Command Syntax and Usage

---

**usm** <usmUser number [1-16]>

This command allows you to create a user security model (USM) entry for an authorized user. You can also configure this entry through SNMP. To view menu options, see [page 197](#).

**view** <vacmViewTreeFamily number [1-128]>

This command allows you to create different MIB views. To view menu options, see [page 198](#).

**access** <vacmAccess number [1-32]>

This command allows you to specify 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 199](#).

**group** <vacmSecurityToGroup number [1-16]>

A group 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 201](#).

---

**Table 6-10** SNMPv3 Configuration Menu Options (/cfg/sys/ssnmp/snmpv3)

---

**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 202](#).

---

**taddr** <*snmpTargetAddr number [1-16]*>

This command 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 203](#).

---

**tparam** <*target params index [1-16]*>

This command 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 204](#).

---

**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 205](#).

---

**v1v2** **disable** | **enable**

This command allows you to enable or disable the access to SNMP version 1 and version 2. This command is enabled by default.

---

**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 6-11** User Security Model Configuration Menu Options (/cfg/sys/ssnmp/snmpv3/usm)

---

#### Command Syntax and Usage

---

**name** <32 character name>

This command allows you to configure a string up to 32 characters long 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

This command allows you to configure the authentication protocol between HMAC-MD5-96 or HMAC-SHA-96. The default algorithm is none.

**authpw**

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. This command allows you to create or change your password for authentication.

**priv** des | none

This command allows you to configure 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**

This command allows you to create or change the privacy password.

---

**Table 6-11** User Security Model Configuration Menu Options (/cfg/sys/ssnmp/snmpv3/usm)

---

**Command Syntax and Usage**

---

**del**

Deletes the USM user entries.

---

**cur**Displays the 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
```

**Table 6-12** SNMPv3 View Menu Options (/cfg/sys/ssnmp/snmpv3/view)

---

**Command Syntax and Usage**

---

**name** <32 character name>

This command defines the name for a family of view subtrees up to a maximum of 32 characters.

**tree** <object identifier, such as, 1.3.6.1.2.1.1.1.0, max 32 characters>

This command defines MIB tree, a string of maximum 32 characters, which when combined with the corresponding mask defines a family of view subtrees.

**mask** <bitmask, max size 32 characters>

This command defines 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.

---

**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
  prefix    - Set content prefix
  model     - Set security model
  level     - Set minimum level of security
  match     - Set prefix only or exact match
  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 6-13** View-based Access Control Model Menu Options (/cfg/sys/ssnmp/snmpv3/access)

---

#### Command Syntax and Usage

---

**name** <32 character name>

Defines the name of the group.

**prefix** <32 character name>

Defines the name of the context. An SNMP context is a collection of management information that an SNMP entity can access. An SNMP entity has access to many contexts. For more information on naming the management information, see RFC2571, the SNMP Architecture document. The view-based Access Control Model defines a table that lists the locally available contexts by contextName.

**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.

**match** **exact** | **prefix**

If the value is set to **exact**, then all the rows whose contextName exactly matches the prefix are selected. If the value is set to **prefix** then the all the rows where the starting octets of the contextName exactly match the prefix are selected.

---

**Table 6-13** View-based Access Control Model Menu Options (/cfg/sys/ssnmp/snmpv3/access)

---

**Command Syntax and Usage**

---

**rview** <32 character view name>

This is a 32 character long 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** <32 character view name>

This is a 32 character long 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** <32 character view name>

This is a 32 character 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 6-14** SNMPv3 Group Menu Options (/cfg/sys/ssnmp/snmpv3/group)

---

#### Command Syntax and Usage

---

**model** *usm | snmpv1 | snmpv2*

Defines the security model.

---

**uname** *<32 character name>*

Sets the user name as defined in /cfg/sys/ssnmp/snmpv3/usm/name on [page 197](#).

---

**gname** *<32 character name>*

The name for the access group as defined in /cfg/sys/ssnmp/snmpv3/access/name on [page 199](#).

---

**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 6-15** SNMPv3 Community Table Configuration Menu Options (/cfg/sys/ssnmp/snmpv3/comm)

---

### Command Syntax and Usage

---

**index** <32 character name>

Allows you to configure the unique index value of a row in this table consisting of 32 characters maximum.

**name** <32 character name>

Defines the user name as defined in /cfg/sys/ssnmp/snmpv3/usm/name on [page 197](#).

**uname** <32 character name>

Defines a readable 32 character long string that represents the corresponding value of an SNMP community name in a security model.

**tag** <list of tag string, max 255 characters>

Allows you to configure a tag of up to 255 characters maximum. This tag 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 6-16** Target Address Table Menu Options (/cfg/sys/ssnmp/snmpv3/taddr)

---

### Command Syntax and Usage

---

**name** <32 character name>

Allows you to configure the locally arbitrary, but unique identifier, target address name associated with this entry.

---

**addr** <transport address ip>

Allows you to configure a transport address IP that can be used in the generation of SNMP traps.

---

**port** <transport address port>

Allows you to configure a transport address port that can be used in the generation of SNMP traps.

---

**taglist** <list of tag string, max 255 characters>

Allows you to configure a list of tags that are used to select target addresses for a particular operation.

---

**pname** <32 character name>

Defines the name as defined in /cfg/sys/ssnmp/snmpv3/tparam/name on [page 204](#).

---

**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
  mpmode1   - 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 6-17** Target Parameters Table Configuration Menu Options (/cfg/sys/ssnmp/snmpv3/tparam)

---

#### Command Syntax and Usage

---

**name** <32 character name>

Allows you to configure the locally arbitrary, but unique identifier that is associated with this entry.

---

**mpmode1** snmpv1 | snmpv2c | snmpv3

Allows you to configure 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** <32 character name>

Defines the name that identifies the user in the USM table ([page 197](#)) 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 6-18** Notify Table Menu Options (/cfg/sys/ssnmp/snmpv3/notify)

---

#### **Command Syntax and Usage**

---

**name** <32 character name>

Defines a locally arbitrary but unique identifier associated with this SNMP notify entry.

**tag** <list of tag string, max 255 characters>

Allows you to configure a tag of 255 characters maximum 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)
  http      - Enable/disable HTTP (Web) access
  https     - HTTPS Web Access Menu
  wport     - Set HTTP (Web) server port number
  snmp      - Set SNMP access control
  userbbi   - Enable/disable user configuration from BBI
  tsbbi     - Enable/disable telnet/ssh configuration from BBI
  tnet      - Enable/disable Telnet access
  tnport    - Set Telnet server port number
  tport     - Set the TFTP port for the system
  cur       - Display current system access configuration
```

**Table 6-19** System Access Menu Options (/cfg/sys/access)

---

#### Command Syntax and Usage

---

##### **mgmt**

Displays the Management Configuration Menu. To view menu options, see [page 208](#).

---

##### **user**

Displays the User Access Control Menu. To view menu options, see [page 209](#).

---

##### **http disable|enable**

Enables or disables HTTP (Web) access to the Browser-Based Interface. It is enabled by default.

---

##### **https**

Displays the HTTPS Menu. To view menu options, see [page 212](#).

---

##### **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).

---

##### **snmp disable|read-only|read-write**

Disables or provides read-only/write-read SNMP access.

---

##### **userbbi enable|disable**

Enables or disables user configuration access through the Browser-Based Interface (BBI).

---

##### **tsbbi enable|disable**

Enables or disables Telnet/SSH configuration access through the Browser-Based Interface (BBI).

---

##### **tnet enable|disable**

Enables or disables Telnet access. This command is enabled by default.

---

**Table 6-19** System Access Menu Options (/cfg/sys/access)

---

**Command Syntax and Usage**

---

**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.

---

**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

This menu is used to define IP address ranges which are allowed to access the switch for management purposes.

**Table 6-20** Management Network Menu Options (/cfg/sys/access/mgmt)

---

#### Command Syntax and Usage

---

**add** <mgmt network address> <mgmt network mask>

Adds a defined network through which switch access is allowed through Telnet, SNMP, RIP, or the Alteon OS 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, it will cause the Firewall Load Balancing health checks to fail and will create a “Network Down” state on the network.

---

**rem** <mgmt network address> <mgmt network mask>

Removes a defined network, which consists of a management network address and a management network mask address.

---

**cur**

Displays the current configuration.

---

## /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** – User passwords can be a maximum of 15 characters.

---

**Table 6-21** User Access Control Menu Options (/cfg/sys/access/user)

---

#### Command Syntax and Usage

---

**uid** <User ID (1-10)>

Displays the User ID Menu. To view menu options, see [page 210](#).

---

**eject user | oper | admin** <user name>

Ejects the specified user from the GbESM.

---

**usrpw**

Sets the user (*user*) password. The user has no direct responsibility for switch management. He or she can view switch status information and statistics, but cannot make any configuration changes.

The user password can have a maximum of 15 characters.

---

**opw**

Sets the operator (*oper*) password. The operator manages all functions of the switch. He or she can view all switch information and statistics and can reset ports or the entire switch.

The operator password can have a maximum of 15 characters.

---

**admpw**

Sets the administrator (*admin*) password. The super user administrator has complete access to all menus, information, and configuration commands on the GbE Switch Module, including the ability to change both the user and administrator passwords.

Access includes “oper” functions.

---

**strongpw**

Displays the Strong User Password Menu. To view menu options, see [page 211](#).

---

**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 6-22** User ID Configuration Menu Options (/cfg/sys/access/user/uid)

---

### Command Syntax and Usage

---

**cos** <user|oper|admin>

Sets the Class-of-Service to define the user's authority level. Alteon OS defines these levels as: User, Operator, and Administrator, with User being the most restricted level.

---

**name** <1-8 characters>

Defines the user name of maximum eight characters.

---

**pswd** <1-15 characters>

Sets the user password of up to 15 characters maximum.

---

**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 6-23** Strong Password Menu Options (/cfg/sys/access/user/strongpw)

---

#### 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.

---

##### **warning** <1-365>

Configures the number of days before password expiration, that a warning is issued to users.

---

##### **faillog** <1-255>

Configures the number of failed login attempts allowed before a security notification is logged.

---

##### **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 6-24** HTTPS Access Configuration Menu Options (/cfg/sys/access/https)

---

#### 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.

---

##### **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) []: Alteon
- 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/port <port alias or number> Port Configuration

```
[Port INT1 Menu]
  gig      - Gig Phy Menu
  aclqos   - Acl/Qos Configuration Menu
  8021ppri - Set default 802.1p priority
  pvid     - Set default port VLAN id
  name     - Set port name
  dscpmrk  - Enable/disable DSCP remarking for port
  learn    - Enable/Disable FDB Learning for port
  tag      - Enable/disable VLAN tagging for port
  tagpvid  - Enable/disable tagging on pvid
  fastfwd  - Enable/disable Port Fast Forwarding mode
  floodblk - Enable/disable Port flood blocking
  ena      - Enable port
  dis      - Disable port
  cur      - Display current port configuration
```

Use the Port Configuration menu to configure settings for individual switch ports, except the management port (MGT). This command is enabled by default.

**Table 6-25** Port Configuration Menu (/cfg/port)

### Command Syntax and Usage

#### **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 215](#).

#### **aclqos**

Displays the ACL Quality of Service Menu. To view menu options, see [page 216](#).

#### **8021ppri** <0-7>

Configures the port's 802.1p priority level.

#### **pvid** <VLAN number, 1-4095>

Sets the default VLAN number which will be used to forward frames which are not VLAN tagged. The default number is 1 for non-management ports.

#### **name** <64 character string> | 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 is set to None.

#### **dscpmark**

Enables or disables DSCP re-marking on a port.

**Table 6-25** Port Configuration Menu (/cfg/port)

---

**Command Syntax and Usage**

---

**learn disable | enable**

Enables or disables FDB learning on the port.

---

**tag disable | enable**

Disables or enables VLAN tagging for this port. It is disabled by default.

---

**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 value is `disabled` for INT and EXT ports, and `enabled` for MGT ports.

---

**fastfwd disable | enable**

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. This feature permits the GbESM to interoperate well within Rapid Spanning Tree networks.

---

**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.

---

**ena**

Enables the port.

---

**dis**

Disables the port. (To temporarily disable a port without changing its configuration attributes, refer to [“Temporarily Disabling a Port”](#) on page 216.)

---

**cur**

Displays current port 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 auto negotiation
  cur    - Display current gig link configuration
```

Use these menu options to set port parameters for the port link.

---

**NOTE** – The speed and mode parameters are fixed for Gigabit Ethernet ports, and cannot be configured.

---

Link menu options are described in [Table 6-26](#) and appear on the `gig` port configuration menu for the GbE Switch Module. Use this menu to set port parameters such as speed, flow control, and negotiation mode for the port link.

**Table 6-26** Port Link Configuration Menu Options (/cfg/port/gig)

---

### **Command Syntax and Usage**

---

#### **speed** 10 | 100 | 1000 | any

Sets the link speed. Some options are not valid on all ports. The choices include:

- 10 Mbps
- 100 Mbps
- 1000 Mbps
- “Auto,” for auto negotiation

---

#### **mode** full | half | any

Sets the operating mode. The choices include:

- “Any,” for auto negotiation (default)
- Full-duplex
- Half-duplex

---

#### **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

---

#### **auto** on | off

Enables or disables auto negotiation for the port.

---

**Table 6-26** Port Link Configuration Menu Options (/cfg/port/gig)**Command Syntax and Usage****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 GbE Switch Module is reset. See the “[Operations Menu](#)” on page 330 for other operations-level commands.

## **/cfg/port <port alias or number> aclqos** **Port ACL Configuration**

```
[Port INT2 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 6-27** Port ACL Menu Options (/cfg/port/aclqos)**Command Syntax and Usage**

**add acl|grp** <ACL number or Group number, 1-896>

Adds the specified ACL or ACL Group to the port. You can add multiple ACL Groups to a port, but the total number of precedence levels allowed is eight.

**rem** <ACL number, 1-896>

Removes the specified ACL or ACL Group from the port.

**cur**

Displays current ACL QoS parameters.

## /cfg/l2

# Layer 2 Configuration

---

```
[Layer 2 Menu]
  8021x    - 802.1x Menu
  mrst     - Multiple Spanning Tree/Rapid Spanning Tree Menu
  stg      - Spanning Tree Menu
  fdb      - FDB Menu
  gvrp     - GVRP configuration menu
  trunk    - Trunk Group Menu
  thash    - IP Trunk Hash Menu
  lacp     - Link Aggregation Control Protocol Menu
  failover - Failover Menu
  vlan     - VLAN Menu
  pvstcomp - Enable/disable PVST+ compatibility mode
  bpdugrd  - Enable/disable BPDU Guard
  macnotif - Enable/disable MAC address notification
  upfast   - Enable/disable Uplink Fast
  update   - UplinkFast station update rate
  cur      - Display current layer 2 parameters
```

**Table 6-28** Layer 2 Configuration Menu (/cfg/l2)

---

### Command Syntax and Usage

---

#### **8021x**

Displays the 802.1x Configuration Menu. To view menu options, see [page 219](#).

#### **mrst**

Displays the Rapid Spanning Tree/Multiple Spanning Tree Protocol Configuration Menu. To view menu options, see [page 225](#).

#### **stg** <group number [1-128]>

Displays the Spanning Tree Configuration Menu. To view menu options, see [page 231](#).

#### **fdb**

Displays the Forwarding Database Menu. To view menu options, see [page 237](#).

#### **gvrp**

Displays the Generic VLAN Registration Protocol (GVRP) Menu. To view menu options, see [page 238](#).

#### **trunk** <trunk group number (1-11)>

Displays the Trunk Group Configuration Menu. To view menu options, see [page 240](#).

#### **thash**

Displays the IP Trunk Hash Menu. To view menu options, see [page 241](#).

---

**Table 6-28** Layer 2 Configuration Menu (/cfg/l2)

---

**Command Syntax and Usage**

---

**lACP**

Displays the Link Aggregation Control Protocol Menu. To view menu options, see [page 243](#).

---

**failover**

Displays the Failover Configuration Menu. To view menu options, see [page 245](#).

---

**vlan** <VLAN number (1-4095)>

Displays the VLAN Configuration Menu. To view menu options, see [page 248](#).

---

**pvstcomp enable | disable**

Enables or disables VLAN tagging of spanning tree BPDUs. The default value is **enabled**.

---

**bpdugrd enable | disable**

Enables or disables BPDU guard, to avoid spanning-tree loops on ports with Port Fast Forwarding enabled (/cfg/port x/fastfwd ena).

---

**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.

---

**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 65500 for all STGs and path cost by 3000 for all external STP ports.

---

**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 GbESM as an IEEE 802.1x Authenticator, to provide port-based network access control.

**Table 6-29** 802.1x Configuration Menu (/cfg/l2/8021x)

---

#### Command Syntax and Usage

---

##### **global**

Displays the global 802.1x Configuration Menu. To view menu options, see [page 220](#).

---

##### **port** <port alias or number>

Displays the 802.1x Port Menu. To view menu options, see [page 223](#).

---

##### **ena**

Globally enables 802.1x.

---

##### **dis**

Globally disables 802.1x.

---

##### **cur**

Displays current 802.1x parameters.

---

## /cfg/12/8021x/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
  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 GbESM.

**Table 6-30** 802.1x Global Configuration Menu Options (/cfg/12/8021x/global)

---

#### Command Syntax and Usage

---

##### **gvlan**

Displays the 802.1x Guest VLAN Configuration Menu. To view menu options, see [page 222](#).

---

##### **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.

---

##### **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 from the authentication server. The default value is 30 seconds.

---

**Table 6-30** 802.1x Global Configuration Menu Options (/cfg/l2/8021x/global)

---

**Command Syntax and Usage**

---

**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.

---

**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 6-31** 802.1x Guest VLAN Configuration Menu (/cfg/l2/8021x/global/gvlan)

---

#### **Command Syntax and Usage**

---

**vlan** <1-4094>

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/12/8021x/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
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 GbESM. These settings override the global 802.1x parameters.

**Table 6-32** 802.1x Port Configuration Menu Options (`/cfg/12/8021x/port`)

---

### 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.

---

#### **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 from the authentication server. The default value is 30 seconds.

---

**Table 6-32** 802.1x Port Configuration Menu Options (/cfg/l2/8021x/port)

---

**Command Syntax and Usage**

---

**svrtimeout** <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.

---

**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/12/mrst

### Rapid Spanning Tree Protocol/ Multiple Spanning Tree Protocol 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) ON
  off       - Globally turn Multiple Spanning Tree (MSTP/RSTP) OFF
  cur       - Display current MST parameters
```

Alteon OS supports the IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP). MSTP allows you to map many VLANs to a small number of spanning tree groups, each with its own topology.

Up to 32 Spanning Tree Groups can be configured in **mstp** mode. MRST is turned off by default.

**NOTE** – When Multiple Spanning Tree is turned on, VLAN 4095 is moved from Spanning Tree Group 128 to the Common Internal Spanning Tree (CIST). When Multiple Spanning Tree is turned off, VLAN 4095 is moved back to Spanning Tree Group 128.

**Table 6-33** MSTP/RSTP Configuration Menu Options (/cfg/12/mrst)

#### Command Syntax and Usage

##### **cist**

Displays the Common Internal Spanning Tree (CIST) Menu. To view menu options, see [page 227](#).

##### **name** <1-32 characters>

Configures a name for the MSTP region. All devices within a MSTP region must have the same region name.

##### **rev** <1-65535>

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 6-33** MSTP/RSTP Configuration Menu Options (/cfg/l2/mrst)

---

**Command Syntax and Usage**

---

**mode** `rstp|mstp`

Selects either Rapid Spanning Tree mode (`rstp`) or Multiple Spanning Tree mode (`mstp`). The default mode is RSTP.

---

**on**

Globally turns RSTP/MSTP ON.

**Note:** When RSTP is turned on, the configuration parameters for STG 1 apply to RSTP.

---

**off**

Globally turns RSTP/MSTP OFF.

---

**cur**

Displays the current RSTP/MSTP 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 6-34](#) 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 6-34** CIST Menu Options (/cfg/l2/mrst/cist)

---

#### Command Syntax and Usage

---

##### **brg**

Displays the CIST Bridge Menu. To view menu options, see [page 228](#).

---

##### **port** <port alias or number>

Displays the CIST Port Menu. To view menu options, see [page 229](#).

---

##### **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 or RSTP mode. CIST parameters do not affect operation of STP/PVST+.

**Table 6-35** CIST Bridge Configuration Menu Options (/cfg/l2/mrst/cist/brg)

---

#### 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, and the default 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)
  link  - Set MSTP link type (auto, p2p, or shared; default: auto)
  edge  - Enable/disable edge port
  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+. For each port, RSTP/MSTP is turned on by default.

**Table 6-36** CIST Port Configuration Menu Options (`/cfg/l2/mrst/cist/port`)

---

### 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. Generally speaking, the faster the port, the lower the path cost. The default is 2000 for 10 Gigabit ports, 20000 for Gigabit ports.

---

#### **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.

---

#### **link** <auto, p2p, or shared; default: auto>

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**.

---

**Table 6-36** CIST Port Configuration Menu Options (/cfg/l2/mrst/cist/port)

---

**Command Syntax and Usage**

---

**edge disable | enable**

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). This command is disabled by default.

---

**on**

Enables MRST on the port.

---

**off**

Disables MRST on the port.

---

**cur**

Displays the current CIST port configuration.

---

## `/cfg/l2/stg <STP group number>` 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
```

Alteon OS 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 (STG 128 is reserved for management).

---

**NOTE** – When VRRP is used for active/active redundancy, STG must be enabled.

---

**Table 6-37** Spanning Tree Configuration Menu (`/cfg/l2/stg`)

---

### Command Syntax and Usage

---

#### **brg**

Displays the Bridge Spanning Tree Menu. To view menu options, see [page 233](#).

---

#### **port** *<port alias or number>*

Displays the Spanning Tree Port Menu. To view menu options, see [page 235](#).

---

#### **add** *<VLAN number (1-4094)>*

Associates a VLAN with a spanning tree and requires an external VLAN ID as a parameter.

---

#### **remove** *<VLAN number (1-4094)>*

Breaks the association between a VLAN and a spanning tree and requires an external 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 6-37** Spanning Tree Configuration Menu (/cfg/l2/stg)

---

**Command Syntax and Usage**

---

**default**

Restores a spanning tree instance to its default configuration.

---

**cur**

Displays current Spanning Tree Protocol parameters.

---

## `/cfg/l2/stg <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)
  aging   - Set bridge Aging Time (1-65535 secs, 0 to disable)
  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
- Bridge aging time

**Table 6-38** Spanning Tree Bridge Menu Options (`/cfg/l2/stg/brg`)

---

### 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 range is 0 to 65535, and the default is 32768.

**RSTP/MSTP:** The range is 0 to 61440, in steps of 4096 (0, 4096, 8192...), and the default is 32768.

**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 227](#)).

**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 227](#)).

---

**Table 6-38** Spanning Tree Bridge Menu Options (/cfg/l2/stg/brg)

---

**Command Syntax and Usage**

---

 **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 227](#)).

---

 **aging**  <new bridge Aging Time (1-65535 secs, 0 to disable)>

Configures the forwarding database aging time. The aging time specifies the amount of time the bridge waits without receiving a packet from a station before removing the station from the forwarding database. The range is 1 to 65535 seconds, and the default is 300 seconds. To disable aging, set this parameter to 0.

---

 **cur** 

Displays the current bridge STG parameters.

---

When configuring STG bridge parameters, the following formulas must be used:

- $2*(fwd-1) \geq mxage$
- $2*(hello+1) \leq mxage$



## `/cfg/l2/stg` <STP Group number> /`port` <port alias or number>

### Spanning Tree Port Configuration

```
[Spanning Tree Port EXT1 Menu]
prior    - Set port Priority (0-255)
cost     - Set port Path Cost (1-65535 (802.1d) /
          1-200000000 (MSTP/RSTP) /0 for auto)
link     - Set port link type (auto, p2p, or shared; default: auto)
edge     - Enable/disable edge port
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 Off for internal ports and management ports, and turned On for external ports. By default for RSTP/MSTP, Spanning Tree is turned Off for internal ports and management ports, and turned On for external ports, with internal ports configured as Edge ports. STG port parameters include:

- Port priority
- Port path cost

The `port` option of STG is turned on by default.

**Table 6-39** Spanning Tree Port Menu Options (`/cfg/l2/stg/port`)

---

#### 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...) and the default is 128.

---

**cost** <new port Path 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. Generally speaking, the faster the port, the lower the path cost. The default is 19 for 100Mbps ports, 4 for 1Gb ports and 2 for 10 Gb ports. A value of 0 (zero) indicates that the default cost will be computed for an auto negotiated link speed.

---

**link** <auto, p2p, or shared; default: auto>

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).

---

**Table 6-39** Spanning Tree Port Menu Options (/cfg/l2/stg/port)

---

**Command Syntax and Usage**

---

**edge disable | enable**

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).

---

**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]
  static    - Static FDB Menu
```

Use the following commands to configure the Forwarding Database (FDB) for the GbESM.

**Table 6-40** FDB Menu Options (/cfg/l2/fdb)

---

#### Command Syntax and Usage

---

##### **static**

Displays the static FDB menu. To view menu options, see [page 237](#).

---

## /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 FDB.

**Table 6-41** Static FDB Menu Options (/cfg/l2/fdb/static)

---

#### Command Syntax and Usage

---

**add** <MAC address> <VLAN number> <port number>

Adds a permanent FDB entry.

---

**del** <MAC address> <VLAN number>

Deletes a permanent FDB entry.

---

**clear** <MAC address> | **all** {**mac** | **vlan** | **port**}

Clears static FDB entries.

---

##### **cur**

Display current static FDB configuration.

---

## /cfg/l2/gvrp

### GVRP Configuration

```
[GVRP configuration Menu]
port      - Port menu
jtime     - Set GARP join time
ltime     - Set GARP leave time
latime    - Set GARP leave all time
dynamic   - Enable/disable dynamic VLAN creation
on        - Globally turn GVRP On
off       - Globally turn GVRP Off
current   - Display current GVRP parameters
```

Use the following commands to configure Generic VLAN Registration Protocol (GVRP).

**Table 6-42** GVRP Menu Options (/cfg/l2/gvrp)

---

#### Command Syntax and Usage

---

##### **port**

Displays the GVRP port menu. To view menu options, see [page 239](#).

---

##### **jtime** <100-65535>

Configures the time interval between GARP Join messages, in milliseconds.  
The default value is 200.

---

##### **ltime** <100-65535>

Configures the GARP Leave time value, in milliseconds. The Leave time is the interval the switch waits before removing the port from a VLAN on which it received the Leave message.  
The default value is 600.

---

##### **latime** <100-65535>

Configures the time interval for GARP Leave-All messages, in milliseconds.  
The default value is 10000.

---

##### **dynamic enable|disable**

Enables or disables dynamic VLAN creation. If you disable dynamic VLAN creation, existing dynamic VLANs persist in the switch, but no new dynamic VLANs are created. To remove all existing dynamic VLANs, turn GVRP **off**.

---

##### **on**

Globally turns GVRP on. With GVRP on, the GbESM processes GPDUs.

---

**Table 6-42** GVRP Menu Options (/cfg/l2/gvrp)

---

**Command Syntax and Usage**

---

**off**

Globally turns GVRP off. With GVRP off, the switch does not process GPDU.

When you turn GVRP off, existing dynamic VLANs are deleted.

---

**cur**

Display current GVRP configuration.

---

## /cfg/l2/gvrp/port GVRP Port Configuration

[GVRP Port EXT2 Menu]

```
setreg    - Set learning GPDU for registrar of this port
setapp    - Set sending GPDU from applicant of this port
ena       - Enable GVRP support for this port
dis       - Disable GVRP support for this port
cur       - Display current GVRP port parameters
```

Use the following commands to configure GVRP settings for the port.

**Table 6-43** GVRP Port Menu Options (/cfg/l2/gvrp/port x)

---

**Command Syntax and Usage**

---

**setreg normal | block**

Configures GPDU learning for the port's GVRP registrar, as follows:

- **Normal:** The registrar listens for GPDU, and learns GVRP attributes from other devices on the network.
  - **Block:** The registrar does not listen for GPDU from other devices.
- 

**setapp normal | block**

Configures GPDU sending for the port's GVRP applicant, as follows:

- **Normal:** The applicant sends GPDU to other devices on the network.
  - **Block:** The applicant does not send GPDU to other devices.
- 

**ena**

Enables GVRP on the port.

---

**dis**

Disables GVRP on the port.

---

**cur**

Display current GVRP port 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 GbE Switch Modules 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 11 trunk groups can be configured on the GbE Switch Module, with the following restrictions:

- Any physical switch port can belong to no more than one trunk group.
- Up to four ports/trunks can belong to the same trunk group.
- Configure all ports in a trunk group with the same link configuration (speed, duplex, flow control).
- Trunking from non-Alteon devices must comply with Cisco® EtherChannel® technology.

By default, each trunk group is empty and disabled.

**Table 6-44** Trunk Configuration Menu Options (`/cfg/l2/trunk`)

---

### Command Syntax and Usage

---

**add** <port alias or number>

Adds a physical port to the current trunk group.

---

**rem** <port alias or number>

Removes a physical port 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

### IP Trunk Hash Configuration

```
[IP Trunk Hash Menu]
  set      - IP Trunk Hash Settings Menu
  cur      - Display current IP trunk hash configuration
```

Use the following commands to configure IP trunk hash settings for the GbESM. The trunk hash settings affect both static trunks and LACP trunks.

**Table 6-45** IP Trunk Hash Menu Options (/cfg/l2/thash)

---

#### Command Syntax and Usage

---

##### set

Displays the Trunk Hash Settings menu. To view menu options, see [page 241](#).

---

##### cur

Display current trunk hash configuration.

---

## /cfg/l2/thash/set

### IP Trunk Hash

```
[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
```

Trunk hash parameters are set globally for the GbE Switch Module. You can enable one or two 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 IP trunk hash parameters for the GbESM.

**Table 6-46** IP Trunk Hash Menu Options (/cfg/l2/thash/set)

---

**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 layer 2 trunk hash setting.

---



## /cfg/l2/lacp

### LACP Configuration

```
[LACP Menu]
  sysprio - Set LACP system priority
  timeout - Set LACP system timeout scale for timing out partner
             info
  port    - LACP port Menu
  cur     - Display current LACP configuration
```

Use the following commands to configure Link Aggregation Control Protocol (LACP) for the GbESM.

**Table 6-47** LACP Menu Options (/cfg/l2/lacp)

---

#### Command Syntax and Usage

---

**sysprio** <1-65535>

Defines the priority value (1 through 65535) for the GbESM. 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 GbESM's CPU utilization rate remains at 100% for periods of 90 seconds or more, consider using static trunks instead of LACP.

---

**port** <port alias or number>

Displays the LACP Port menu. To view menu options, see [page 244](#).

---

**cur**

Display current LACP configuration.

---

## **/cfg/l2/lacp/port** <port alias or number> LACP Port Configuration

[LACP Port EXT1 Menu]	
mode	- Set LACP mode
prio	- Set LACP port priority
adminkey	- Set LACP port admin key
cur	- Display current LACP port configuration

Use the following commands to configure Link Aggregation Control Protocol (LACP) for the selected port.

**Table 6-48** LACP Port Menu Options (/cfg/l2/lacp/port)

---

### 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 LACPDU.
- **passive**  
Turn LACP on and set this port to passive. Passive ports do not initiate LACPDU, but respond to LACPDU from active ports.

---

**prio** <1-65535>

Sets the priority value for the selected port. Lower numbers provide higher priority. Default 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.

---

**cur**

Displays the current LACP configuration for this port.

---

## /cfg/l2/failovr

### Layer 2 Failover Configuration

```
[Failover Menu]
trigger - Trigger Menu
vlan    - Globally turn VLAN Monitor ON/OFF
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 Alteon OS *Application Guide*.

**Table 6-49** Layer 2 Failover Menu Options (/cfg/l2/failovr)

---

#### Command Syntax and Usage

---

##### **trigger** <1-8>

Displays the Failover Trigger menu. To view menu options, see [page 246](#).

---

##### **vlan on|off**

Globally turns VLAN monitor on or off. When the VLAN Monitor is on, the switch automatically disables only internal ports that belong to the same VLAN as ports in the failover trigger. The default value is off.

---

##### **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

### Failover Trigger Configuration

```
[Trigger 1 Menu]
  amon      - Auto Monitor Menu
  limit     - Limit of Trigger
  ena       - Enable Trigger
  dis       - Disable Trigger
  cur       - Display current Trigger configuration
```

**Table 6-50** Failover Trigger Menu Options (/cfg/l2/failovr/trigger)

---

#### Command Syntax and Usage

---

##### **amon**

Displays the Auto Monitor menu for the selected trigger. To view menu options, see [page 247](#).

---

##### **limit** <0-2>

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.

---

##### **cur**

Displays the current failover trigger settings.

---

## /cfg/l2/failovr/trigger/amon

### Auto Monitor Configuration

[Auto Monitor Menu]	
addtrnk	- Add trunk to Auto Monitor
remtrnk	- Remove trunk from Auto Monitor
addkey	- Add LACP port adminkey to Auto Monitor
remkey	- Remove LACP port adminkey from Auto Monitor
cur	- Display current Auto Monitor configuration

**Table 6-51** Auto Monitor Menu Options (/cfg/l2/failovr/trigger/amon)

---

#### Command Syntax and Usage

---

**addtrnk** <Trunk Group number (1-11)>  
Adds a trunk group to the Auto Monitor.

---

**remtrnk** <Trunk Group number (1-11)>  
Removes a trunk group from the Auto Monitor.

---

**addkey** <1-65535>  
Adds a LACP admin key to the Auto Monitor. LACP trunks formed with this admin key will be included in the Auto Monitor.

---

**remkey** <1-65535>  
Removes a LACP admin key from the Auto Monitor.

---

**cur**  
Displays the current Auto Monitor settings.

---

## `/cfg/12/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
  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. For more information on configuring VLANs, see “[Setup Part 3: VLANs](#)” on page 38.

By default, the VLAN menu option is disabled except VLAN 1, which is enabled all the time. Internal server ports (INTx) and external ports (EXTx) are in VLAN 1 by default. Up to 1024 VLANs can be configured on the GbESM.

**Table 6-52** VLAN Configuration Menu Options (`/cfg/12/vlan`)

---

### Command Syntax and Usage

---

**pvlan** *<1-8>*

Displays the Protocol-based VLAN menu. To view menu options, see [page 250](#).

---

**privlan**

Displays the Private VLAN menu. To view menu options, see [page 252](#).

---

**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 [1-128]>*

Assigns a VLAN to a Spanning Tree Group.

---

**add** *<port alias or number>*

Adds port(s) to the VLAN membership.

---

**rem** *<port alias or number>*

Removes port(s) from this VLAN.

---

**Table 6-52** VLAN Configuration Menu Options (/cfg/l2/vlan)

---

**Command Syntax and Usage**

---

**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, internal server ports (INTx) and external ports (EXTx) are in 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 213](#)).

---

## `/cfg/l2/vlan/pvlan` *<protocol number>* **Protocol-based VLAN Configuration**

```
[VLAN 1 Protocol 1 Menu]
  pty      - Set protocol type
  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 6-53** PVLAN Menu Options (`/cfg/l2/vlan/pvlan`)

---

### 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).

---

**prio** *<0-7>*

Configures the priority value for this PVLAN.

---

**add**

Adds a port to the selected PVLAN.

---

**rem**

Removes a port from the selected PVLAN.

---

**del**

Deletes the selected protocol configuration from the VLAN.

---

**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**

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.

---



**Table 6-53** PVLAN Menu Options (/cfg/l2/vlan/pvlan)

---

**Command Syntax and Usage**

---

**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 6-54** Private VLAN Menu Options (/cfg/l2/vlan/privlan)

---

### Command Syntax and Usage

---

**type primary|isolated|community**

Defines the VLAN type, as follows:

- **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>**

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

```
[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
  rtrid   - Set router ID
  cur     - Display current IP configuration
```

**Table 6-55** Layer 3 Configuration Menu (/cfg/l3)

### Command Syntax and Usage

**if** <interface number (1-128)>

Displays the IP Interface Menu. To view menu options, see [page 255](#).

**gw** <default gateway number (1-4)>

Displays the IP Default Gateway Menu. To view menu options, see [page 256](#).

**route**

Displays the IP Static Route Menu. To view menu options, see [page 258](#).

**mroute**

Displays the Static IP Multicast Route Menu. To view menu options, see [page 259](#).

**arp**

Displays the Address Resolution Protocol Menu. To view menu options, see [page 260](#).

**frwd**

Displays the IP Forwarding Menu. To view menu options, see [page 262](#).

**nwf** <Network filter number (1-256)>

Displays the Network Filter Configuration Menu. To view menu options see [page 263](#).

**Table 6-55** Layer 3 Configuration Menu (/cfg/l3)

---

**Command Syntax and Usage**

---

**rmap** <route map number (1-32)>Displays the Route Map Menu. To view menu options see [page 264](#).

---

**rip**Displays the Routing Interface Protocol Menu. To view menu options, see [page 268](#).

---

**ospf**Displays the OSPF Menu. To view menu options, see [page 271](#).

---

**bgp**Displays the Border Gateway Protocol Menu. To view menu options, see [page 281](#).

---

**igmp**Displays the IGMP Menu. To view menu options, see [page 287](#).

---

**dns**Displays the IP Domain Name System Menu. To view menu options, see [page 297](#).

---

**bootp**Displays the Bootstrap Protocol Menu. To view menu options, see [page 298](#).

---

**vrrp**Displays the Virtual Router Redundancy Configuration Menu. To view menu options, see [page 299](#).

---

**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]
  addr    - Set IP address
  mask    - Set subnet mask
  vlan    - Set VLAN number
  relay   - Enable or disable BOOTP relay
  ena     - Enable interface
  dis     - Disable interface
  del     - Delete interface
  cur     - Display current interface configuration
```

The GbE Switch Module can be configured with up to 128 IP interfaces. Each IP interface represents the GbE Switch Module on an IP subnet on your network. The Interface option is disabled by default.

---

**NOTE** – To maintain connectivity between the management module and the GbE Switch Module, use the management module interface to change the IP address of the switch.

---

**Table 6-56** IP Interface Menu Options (/cfg/l3/if)

---

### Command Syntax and Usage

---

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

Configures the IP address of the switch interface using dotted decimal notation.

---

**mask** <IP subnet mask (such as 255.255.255.0)>

Configures the IP subnet address mask for the interface using dotted decimal notation.

---

**vlan** <VLAN number (1-4095)>

Configures the VLAN number for this interface. Each interface can belong to one VLAN, though any VLAN can have multiple IP interfaces in it.

---

**relay** **disable** | **enable**

Enables or disables the BOOTP relay on this interface. It is enabled by default.

---

**ena**

Enables this IP interface.

---

**dis**

Disables this IP interface.

---

**Table 6-56** IP Interface Menu Options (/cfg/l3/if)**Command Syntax and Usage****del**

Removes this IP interface.

**cur**

Displays the current interface settings.

## /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
```

**NOTE** – The switch can be configured with up to 4 gateways. Gateway 4 is reserved for management.

This option is disabled by default.

**Table 6-57** Default Gateway Menu Options (/cfg/l3/gw)**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. This command is disabled by default.

**Table 6-57** Default Gateway Menu Options (/cfg/l3/gw)

---

**Command Syntax and Usage**

---

**ena**

Enables the gateway for use.

---

**dis**

Disables the gateway.

---

**del**

Deletes the gateway from the configuration.

---

**cur**

Displays the current gateway settings.

---

## /cfg/l3/route

### IP Static Route Configuration

[IP Static Route Menu]	
add	- Add static route
rem	- Remove static route
cur	- Display current static routes

Up to 128 static routes can be configured.

**Table 6-58** IP Static Route Configuration Menu Options (cfg/l3/route)

---

#### 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>

Removes a static route. The destination address of the route to remove must be specified using dotted decimal notation.

---

**cur**

Displays the current IP static routes.

---



## /cfg/l3/mroute

### IP Multicast Route Configuration

```
[IPMC Static Route Menu]
  add      - Add static IP Multicast route
  rem      - Remove static IP Multicast route
  cur      - Display current static IPMC route configuration
```

The following table describes the IP Multicast Route menu options.

**Table 6-59** IP Static Route Configuration Menu Options (cfg/l3/mroute)

---

#### Command Syntax and Usage

---

**add** *<IPMC destination>* *<vlan>* *<port>* **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.

---

**rem** *<IPMC destination>* *<vlan>* *<port>* **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.

---

**cur**  
 Displays the current IP multicast routes.

---

## /cfg/13/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 6-60** ARP Configuration Menu Options (/cfg/13/arp)

---

#### Command Syntax and Usage

---

##### **static**

Displays Static ARP menu. To view options, see [page 261](#).

---

##### **rearp** <2-120 minutes>

Defines re-ARP period in minutes. You can set this duration between two and 120 minutes.

---

##### **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 learnt 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 6-61** ARP Static Configuration Menu Options (/cfg/l3/arp/static)

---

#### 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** [*<interface number>* | *<VLAN number>* | *<port number>* | all] <ARP entry 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
on	- Globally turn IP Forwarding ON
off	- Globally turn IP Forwarding OFF
cur	- Display current IP Forwarding configuration

**Table 6-62** IP Forwarding Configuration Menu Options (/cfg/l3/frwd)

---

#### Command Syntax and Usage

---

##### **dirbr** **disable** | **enable**

Enables or disables forwarding directed broadcasts. This command is disabled by default.

---

##### **noicmprd** **disable** | **enable**

Enables or disables ICMP re-directs. This command is disabled by default.

---

##### **on**

Enables IP forwarding (routing) on the GbE Switch Module.

---

##### **off**

Disables IP forwarding (routing) on the GbE Switch Module. Forwarding is turned off by default.

---

##### **cur**

Displays the current IP forwarding settings.

---

## /cfg/13/nwf

# Network Filter Configuration

```
[IP Network Filter 1 Menu]
  addr    - IP Address
  mask    - IP Subnet mask
  enable  - Enable Network Filter
  disable - Disable Network Filter
  delete  - Delete Network Filter
  current - Display current Network Filter configuration
```

**Table 6-63** IP Network Filter Menu Options (/cfg/13/nwf)

---

### Command Syntax and Usage

---

**addr** <IP address, such as 192.4.17.44>

Sets the starting IP address for this filter. The default address is 0.0.0.0.

**mask** <subnet mask, such as 255.255.255.0>

Sets the IP subnet mask that is used with /cfg/13/nwf/addr to define the range of IP addresses that will be accepted by the peer when the filter is enabled. 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.

**current**

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
  current    - Display current route map configuration
```

Routing maps control and modify routing information.

**Table 6-64** Routing Map Menu Options (`/cfg/l3/rmap`)

### Command Syntax and Usage

**alist** <number 1-8>

Displays the Access List menu. For more information, see [page 266](#).

**aspath** <number 1-8>

Displays the Autonomous System (AS) Filter menu. For more information, see [page 267](#).

**ap** <AS number> [<AS number>] [<AS number>] | **none**

Sets the AS path preference of the matched route. One to three path preferences can be configured.

**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.

**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.

**Table 6-64** Routing Map Menu Options (/cfg/l3/rmap) (Continued)

---

**Command Syntax and Usage**

---

**prec** <value (1-256)>

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.

---

**current**

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.

---

<pre>[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   current  - Display current Access List configuration</pre>
--

**Table 6-65** IP Access List Menu Options (/cfg/l3/rmap/alist)

---

#### Command Syntax and Usage

**nwf** <network filter number (1-256)>

Sets the network filter number. See “/cfg/l3/nwf” on page 263 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.

**current**

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.

---

<pre>[AS Filter 1 Menu]   as          - AS number   action     - Set AS Filter action   enable     - Enable AS Filter   disable    - Disable AS Filter   delete     - Delete AS Filter   current    - Display current AS Filter configuration</pre>
---

**Table 6-66** AS Filter Menu Options (/cfg/l3/rmap/aspath)

---

#### 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.

---

**current**

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
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 6-67** RIP Menu Options (/cfg/l3/rip)

---

#### Command Syntax and Usage

---

**if** <1-127>

Displays the RIP Interface menu. For more information, see [page 269](#).

---

**update** <1-120>

Configures the time interval for sending for RIP table updates, in seconds.  
The default value is 30 seconds.

---

**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 Menu is used for configuring Routing Information Protocol parameters. This option is turned off by default.

---

**NOTE** – Do not configure RIP1 parameters if your routing equipment uses RIP version 2.

---

**Table 6-68** RIP Interface Menu Options (/cfg/l3/rip/if)

---

### Command Syntax and Usage

---

**version 1|2|both**

Configures the RIP version used by this interface. The default value is version 1.

---

**supply disable|enable**

This command is disabled by default. When enabled, the switch supplies routes to other routers.

---

**listen disable|enable**

This command is disabled by default. When enabled, the switch learns routes from other routers.

---

**poison disable|enable**

This command is disabled by default. When enabled, the switch uses split horizon with poisoned reverse. When disabled, the switch uses only split horizon.

---

**split disable|enable**

Enables or disables split horizon.

---

**Table 6-68** RIP Interface Menu Options (/cfg/l3/rip/if)

---

**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 `disabled`.

---

**mcast disable | enable**

Enables or disables multicast updates of the routing table (using address 224.0.0.9). The default value is `disabled`.

---

**default none | listen | supply | both**

Configures the default route action.

---

**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**

Configures the authentication key password.

---

**enable**

Enables this RIP interface.

---

**disable**

Disables this RIP interface.

---

**current**

Displays the current RIP 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
  redistrib - 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 6-69** OSPF Configuration Menu (/cfg/l3/ospf)

---

#### 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 273](#) to view menu options.

---

**range** <range number (1-16)>

Displays summary routes menu for up to 16 IP addresses. See [page 274](#) to view menu options.

---

**if** <interface number (1-128)>

Displays the OSPF interface configuration menu. See [page 275](#) to view menu options.

---

**virt** <virtual link (1-3)>

Displays the Virtual Links menu used to configure OSPF for a Virtual Link. See [page 277](#) to view menu options.

---

**md5key** <key ID (1-255)>

Assigns a string to MD5 authentication key.

---

**host** <host entry number (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 278](#) to view menu options.

---

**redist** fixed|static|rip|ebgp|ibgp

Displays Route Distribution Menu. See [page 279](#) to view menu options.

---

**lsdb** <LSDB limit (0-2000, 0 for no limit)>

Sets the link state database limit.

---

**Table 6-69** OSPF Configuration Menu (/cfg/l3/ospf)

---

**Command Syntax and Usage**

---

**default** <metric (1-16777215)> <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 GbE Switch Module.

---

**off**

Disables OSPF on the GbE Switch Module.

---

**cur**Displays the current OSPF configuration settings.

---

## /cfg/l3/ospf/aindex <area index> 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 6-70** Area Index Configuration Menu Options (/cfg/l3/ospf/aindex)

---

### 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.

---

**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 (0-255)>

Sets time interval between two successive SPF (shortest path first) calculations of the shortest path tree using the Dijkstra's algorithm.

---

**Table 6-70** Area Index Configuration Menu Options (/cfg/l3/ospf/aindex)**Command Syntax and Usage****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 6-71** OSPF Summary Range Configuration Menu Options (/cfg/l3/ospf/range)**Command Syntax and Usage****addr** <IP Address (such as, 192.4.17.101)>

Configures the base IP address for the range.

**mask** <IP address (such as, 192.4.17.101)>

Configures the IP address mask for the range.

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

Configures the area index used by the GbE Switch Module.

**hide disable|enable**

Hides the OSPF summary range.

**enable**

Enables the OSPF summary range.



**Table 6-71** OSPF Summary Range Configuration Menu Options (/cfg/l3/ospf/range)**Command Syntax and Usage****disable**

Disables the OSPF summary range.

**delete**

Deletes the OSPF summary range.

**current**

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
  dead   - Set dead interval in seconds
  trans  - Set transit delay in seconds
  retra  - Set retransmit interval in seconds
  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 6-72** OSPF Interface Configuration Menu Options (/cfg/l3/ospf/if)**Command Syntax and Usage****aindex** <area index (0-2)>

Configures the OSPF area index.

**prio** <priority value (0-255)>

Configures the priority value for the GbE Switch Module'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** <cost value (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.

**Table 6-72** OSPF Interface Configuration Menu Options (/cfg/l3/ospf/if)

---

**Command Syntax and Usage**

---

**hello** <value (1-65535)>Configures the interval in seconds between the `hello` packets for the interfaces.**dead** <value (1-65535)>Configures the health parameters of a `hello` packet, which is set for an interval of seconds before declaring a silent router to be down.**trans** <value (0-3600)>

Configures the transit delay in seconds.

**retra** <value (0-3600)>

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.

**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
  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
  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 6-73** OSPF Virtual Link Configuration Menu Options (/cfg/l3/ospf/virt)

---

### Command Syntax and Usage

---

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

Configures the OSPF area index.

---

**hello** <value (1-65535)>

Configures the authentication parameters of a hello packet, in seconds.

---

**dead** <value (1-65535)>

Configures the health parameters of a hello packet, in seconds. Default is 60 seconds.

---

**trans** <value (1-3600)>

Configures the delay in transit, in seconds. Default is one second.

---

**retra** <value (1-3600)>

Configures the retransmit interval, in seconds. Default is five seconds.

---

**nbr** <NBR router ID (IP address)>

Configures the router ID of the virtual neighbor. Default is 0.0.0.0.

---

**key** <password>

Configures the password (up to eight characters) for each virtual link. Default is none.

---

**mdkey** <key ID (1-255)> | none

Sets MD5 key ID for each virtual link. Default is none.

---

**enable**

Enables OSPF virtual link.

---

**Table 6-73** OSPF Virtual Link Configuration Menu Options (/cfg/l3/ospf/virt)**Command Syntax and Usage****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 6-74** OSPF Host Entry Configuration Menu Options (/cfg/l3/ospf/host)**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 (0-2)>

Configures the area index of the host.

**cost** <cost value (1-65535)>

Configures the cost value of the host.

**enable**

Enables OSPF host entry.

**disable**

Disables OSPF host entry.

**Table 6-74** OSPF Host Entry Configuration Menu Options (/cfg/l3/ospf/host)

---

**Command Syntax and Usage**

---

**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 6-75** OSPF Route Redistribution Menu Options (/cfg/l3/ospf/redist)

---

**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/13/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 6-76** OSPF MD5 Key Configuration Menu Options (/cfg/ip/ospf/md5key)

---

### Command Syntax and Usage

---

**key**

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.

The BGP Menu enables 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 Alteon OS implementation, the GbE Switch Module does not advertise BGP routes that are learned from other BGP “speakers”.

The BGP menu option is turned off by default.

---

**NOTE** – Fixed routes are subnet routes. There is one fixed route per IP interface.

---

**Table 6-77** Border Gateway Protocol Menu (/cfg/l3/bgp)

---

### 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 283](#).

**aggr** <aggregate number (1-16)>

Displays the Aggregation Menu. To view menu options, see [page 286](#).

---

**Table 6-77** Border Gateway Protocol Menu (/cfg/l3/bgp)

---

**Command Syntax and Usage**

---

**as** <I-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]
  redistribute - 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
  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 6-78** BGP Peer Configuration Menu Options (`/cfg/l3/bgp/peer`)

---

### Command Syntax and Usage

---

#### **redist**

Displays BGP Redistribution Menu. To view the menu options, see [page 285](#).

---

#### **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 seconds.

---

#### **alive** *<keepalive time (0, 1-21845)>*

Sets the keep-alive time for the specified peer, in seconds. The default value is 60 seconds.

---

**Table 6-78** BGP Peer Configuration Menu Options (/cfg/l3/bgp/peer)**Command Syntax and Usage****advert** <min adv time (1-65535)>

Sets time in seconds between advertisements.

**retry** <connect retry interval (1-65535)>

Sets connection retry interval, in seconds.

**orig** <min orig time (1-65535)>

Sets the minimum time between route originations, in 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.

**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.

**ena**

Enables this peer configuration.

**dis**

Disables this peer configuration.

**del**

Deletes this peer configuration.

**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 6-79** BGP Redistribution Menu Options (/cfg/l3/bgp/peer/redist)

---

#### Command Syntax and Usage

---

**metric** <metric (1-4294967294)> | **none**

Sets default metric of advertised routes.

**default** **none** | **import** | **originate** | **redistribute**

Sets default route action.

Defaults routes can be configured as import, originate, redistribute, or none.

**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.

**current**

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 6-80** BGP Aggregation Configuration Menu Options (/cfg/l3/bgp/aggr)

---

### 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 aggregated to one route 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 6-81](#) describes the commands used to configure basic IGMP parameters.

**Table 6-81** IGMP Menu Options (/cfg/l3/igmp)

---

#### Command Syntax and Usage

---

##### **snoop**

Displays the IGMP Snoop Menu. To view menu options, see [page 288](#).

---

##### **relay**

Displays the IGMP Relay Menu. To view menu options, see [page 290](#).

---

##### **mrouter**

Displays the Static Multicast Router Menu. To view menu options, see [page 292](#).

---

##### **igmpflt**

Displays the IGMP Filtering Menu. To view menu options, see [page 293](#).

---

##### **adv**

Displays the IGMP Advanced Menu. To view menu options, see [page 296](#).

---

##### **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
  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 6-82](#) describes the commands used to configure IGMP Snooping.

**Table 6-82** IGMP Snoop Menu Options (/cfg/l3/igmp/snoop)

---

#### Command Syntax and Usage

---

##### **igmpv3**

Displays the IGMP version 3 Menu. To view menu options, see [page 289](#).

---

##### **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 (1-4094)>

Adds the selected VLAN(s) to IGMP Snooping.

---

##### **rem** <VLAN number (1-4094)>

Removes the selected VLAN(s) from IGMP Snooping.

---

##### **clear**

Removes all VLANs from IGMP Snooping.

---

**Table 6-82** IGMP Snoop Menu Options (/cfg/l3/igmp/snoop)

---

**Command Syntax and Usage**

---

**ena**Enables IGMP Snooping.

---

**dis**Disables IGMP Snooping.

---

**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 6-85 describes the commands used to configure IGMP version 3.

**Table 6-83** IGMP V3 Menu Options (/cfg/l3/igmp/snoop/igmpv3)

---

**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.

---

**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**.

---

**Table 6-83** IGMP V3 Menu Options (/cfg/l3/igmp/snoop/igmpv3)**Command Syntax and Usage****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 6-85](#) describes the commands used to configure IGMP Relay.

**Table 6-84** IGMP Relay Menu Options (/cfg/l3/igmp/relay)**Command Syntax and Usage****mrtr** <multicast router number (1-2)>

Displays the Upstream Multicast Router Menu. To view menu options, see [page 291](#).

**add** <VLAN number (1-4094)>

Adds the VLAN to the list of IGMP Relay VLANs.

**rem** <VLAN number (1-4094)>

Removes the VLAN from the list of IGMP Relay VLANs.

**clear**

Removes all VLANs from the list of IGMP Relay VLANs.

**report** <0-150>

Configures the interval between unsolicited Join reports sent by the switch, in seconds.  
The default value is 10.

**ena**

Enables IGMP Relay.



**Table 6-84** IGMP Relay Menu Options (/cfg/l3/igmp/relay)**Command Syntax and Usage****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 6-87](#) describes the commands used to configure the IGMP Relay multicast router.

**Table 6-85** IGMP Relay Mrouter Menu Options (/cfg/l3/igmp/relay/mrtr)**Command Syntax and Usage****addr** <IP address (such as 192.4.17.101)>

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.

**Table 6-85** IGMP Relay Mrouter Menu Options (/cfg/l3/igmp/relay/mrtr)**Command Syntax and Usage****ena**

Enables the multicast router.

**dis**

Disables the multicast router.

**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 6-86](#) describes the commands used to configure a static multicast router.

**NOTE** – When you configure a static multicast router on a VLAN, the process of learning multicast routers is disabled for that VLAN.

**Table 6-86** IGMP Static Multicast Router Menu Options (/cfg/l3/igmp/mrouter)**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.

**remove** <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 6-87](#) describes the commands used to configure an IGMP filter.

**Table 6-87** IGMP Filtering Menu Options (/cfg/l3/igmp/igmpflt)

---

#### Command Syntax and Usage

---

**filter** <filter number (1-16)>

Displays the IGMP Filter Definition Menu. To view menu options, see [page 294](#).

---

**port** <port number>

Displays the IGMP Filtering Port Menu. To view menu options, see [page 295](#).

---

**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 6-88 describes the commands used to define an IGMP filter.

**Table 6-88** IGMP Filter Definition Menu Options (`/cfg/l3/igmp/igmpflt/filter`)

---

### Command Syntax and Usage

---

**range** *<IP multicast address (such as 224.0.0.10)>* *<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.

---

**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 alias or number>* IGMP Filtering Port Configuration

```
[IGMP Port EXT1 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 6-89 describes the commands used to configure a port for IGMP filtering.

**Table 6-89** IGMP Filter Port Menu Options (`/cfg/l3/igmp/igmpflt/port`)

---

### 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]
  qinterval - 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
  cur       - Display current IGMP Advanced configuration
```

Table 6-87 describes the commands used to configure advanced IGMP parameters.

**Table 6-90** IGMP Advanced Menu Options (/cfg/l3/igmp/adv)

---

#### 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 seconds>

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 (1-4094)> **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 reports to all ports. The default setting is enabled.

**Note:** If IGMP hosts reside on different VLANs, you must disable IGMP flooding to ensure that multicast data is forwarded across the VLANs.

---

##### **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
  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 6-91** Domain Name Service Menu Options (/cfg/l3/dns)

---

### Command Syntax and Usage

---

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

You will be prompted to set the IP address for your primary DNS server. Use dotted decimal notation.

---

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

You will be prompted to set the IP address for your secondary DNS server. If the primary DNS server fails, the configured secondary will be used instead. Enter the IP address using dotted decimal notation.

---

**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]
  addr      - Set IP address of BOOTP server
  addr2     - Set IP address of second BOOTP server
  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 GbE Switch Module.

BOOTP relay is turned off by default.

**Table 6-92** Bootstrap Protocol Relay Configuration Menu Options (/cfg/l3/bootp)

---

#### Command Syntax and Usage

---

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

Sets the IP address of the BOOTP server.

---

**addr2** <IP address (such as 192.4.17.101)>

Sets the IP address of the second BOOTP server.

---

**on**

Globally turns on BOOTP relay.

---

**off**

Globally turns off BOOTP relay.

---

**cur**

Displays the current BOOTP relay configuration.

---



## /cfg/13/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
hotstan - Enable/disable hot-standby processing
on      - Globally turn VRRP ON
off     - Globally turn VRRP OFF
cur     - Display current VRRP configuration
```

Virtual Router Redundancy Protocol (VRRP) support on GbE Switch Modules 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. Alteon OS 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 *Alteon OS Application Guide*.

**Table 6-93** VRRP Menu Options (/cfg/13/vrrp)

---

#### Command Syntax and Usage

---

**vr** <virtual router number (1-1024)>

Displays the VRRP Virtual Router Menu. This menu is used for configuring virtual routers on this switch. To view menu options, see [page 301](#).

---

**group**

Displays the VRRP virtual router group menu, used to combine all virtual routers together as one logical entity. Group options must be configured when using two or more Alteon switches in a hot-standby failover configuration where only one switch is active at any given time. To view menu options, see [page 304](#).

---

**if** <interface number (1-127)>

Displays the VRRP Virtual Router Interface Menu. To view menu options, see [page 307](#).

---

**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 308](#).

---

**Table 6-93** VRRP Menu Options (/cfg/l3/vrrp)

---

**Command Syntax and Usage**

---

**hotstan** **disable** | **enable**

Enables or disables hot standby processing, in which two or more switches provide redundancy for each other. By default, this option is disabled.

---

**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 rener priority
  adver - Set advertisement interval
  preem - Enable or disable preemption
  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 6-94** VRRP Virtual Router Menu Options (/cfg/l3/vrrp/vr)

---

### Command Syntax and Usage

---

#### **track**

Displays the VRRP Priority Tracking Menu for this virtual router. Tracking is an Alteon OS proprietary extension to VRRP, used for modifying the standard priority system used for electing the master router. To view menu options, see [page 303](#).

---

#### **vrid** <virtual router ID (1-1024)>

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 1024. The default value is 1.

All `vrid` values must be unique within the VLAN to which the virtual router's IP interface belongs.

---

#### **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.

---

**Table 6-94** VRRP Virtual Router Menu Options (/cfg/l3/vrrp/vr)

---

**Command Syntax and Usage**

---

**if** <interface number (1-127)>

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 preempt another virtual router which has assumed master routing authority. This preemption occurs even if the `preem` option below is disabled. The default value is 1.

---

**prio** <priority (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** <seconds (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.

---

**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.

---

**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 308](#)).

Criteria are tracked dynamically, continuously updating virtual router priority levels when enabled. If the virtual router preemption option (see `preem` in [Table 6-94 on page 301](#)) 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 6-95** Virtual Router Priority Tracking Menu Options (`/cfg/l3/vrrp/vr #/track`)

---

### 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.

---

#### `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 reenter priority
  adver   - Set advertisement interval
  preem   - Enable or disable preemption
  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 GbE Switch Module 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.

---

**NOTE** – This option is required to be configured only when using at least two GbE Switch Modules in a hot-standby failover configuration, where only one switch is active at any time.

---

**Table 6-96** Virtual Router Group Menu Options (/cfg/l3/vrrp/group)

---

#### Command Syntax and Usage

---

##### **track**

Displays the VRRP Priority Tracking Menu for the virtual router group. Tracking is an Alteon OS proprietary extension to VRRP, used for modifying the standard priority system used for electing the master router. To view menu options, see [page 306](#).

---

##### **vrid** <virtual router ID (1-1024)>

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 1024. 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 (1-127)>

Selects a switch IP interface. The default switch IP interface number is 1.

---

**Table 6-96** Virtual Router Group Menu Options (/cfg/l3/vrrp/group)

---

**Command Syntax and Usage**

---

**prio** <priority (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** <seconds (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.

---

**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 6-97** Virtual Router Group Priority Tracking Menu (/cfg/l3/vr/group/track)

#### 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* (1 to 127) 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 6-98** VRRP Interface Menu Options (/cfg/l3/vrrp/if)

---

### 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 Menu” on [page 303](#)), the priority level for the virtual router is increased by an amount defined through this menu.

**Table 6-99** VRRP Tracking Menu Options (/cfg/l3/vrrp/track)

---

#### 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 303](#)) are enabled.

---

**/cfg/qos**

## Quality of Service Configuration

---

[QoS Menu]	
8021p	- 802.1p Menu
dscp	- Dscp Menu

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 6-100** Quality of Service Menu Options (/cfg/qos)

---

### Command Syntax and Usage

---

#### **8021p**

Displays 802.1p configuration menu. To view menu options, see [page 310](#).

---

#### **dscp**

Displays DSCP configuration menu. To view menu options, see [page 311](#).

---

## /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
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 6-101** 802.1p Menu Options (/cfg/qos/8021p)

---

#### Command Syntax and Usage

---

**priq** <0-7> <0-1>|<0-7>

Maps the 802.1p priority of the Class of Service queue (COSq) priority. Enter the 802.1p priority value (0-7), followed by the Class of Service queue that handles the matching traffic.

**qweight** <0-1>|<0-7> <0-15>

Configures the weight of the selected Class of Service queue (COSq). Enter the queue number, followed by the scheduling weight (0-15).

**numcos** 2|8

Sets the number of Class of Service queues for switch ports. The default value is 2.

**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 6-102** DSCP Menu Options (/cfg/qos/dscp)

---

#### Command Syntax and Usage

---

##### **dscp** <0-63> <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.

---

## /cfg/acl

# Access Control List Configuration

---

[ACL Menu]	
acl	- Access Control List Item Config Menu
group	- Access Control List Group Config Menu
cur	- Display current ACL configuration

Use this menu to create Access Control Lists and ACL Groups. ACLs define matching criteria used for IP filtering and Quality of Service functions.

**Table 6-103** ACL Menu Options (/cfg/acl)

---

### Command Syntax and Usage

---

**acl** <1-896>

Displays Access Control List configuration menu. To view menu options, see [page 313](#).

**group** <1-896>

Displays ACL Group configuration menu. To view menu options, see [page 323](#).

**cur**

Displays the current ACL parameters.

---

## `/cfg/acl/acl <ACL number>` **ACL Configuration**

```
[ACL 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 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 6-104** ACL Menu Options (`/cfg/acl/acl x`)

---

### Command Syntax and Usage

---

#### **ethernet**

Displays the ACL Ethernet Header menu. To view menu options, see [page 314](#).

---

#### **ipv4**

Displays the ACL IP Header menu. To view menu options, see [page 315](#).

---

#### **tcpudp**

Displays the ACL TCP/UDP Header menu. To view menu options, see [page 317](#).

---

#### **meter**

Displays the ACL Metering menu. To view menu options, see [page 318](#).

---

#### **re-mark**

Displays the ACL Re-mark menu. To view menu options, see [page 319](#).

---

#### **pktfmt** *<packet format>*

Displays the ACL Packet Format menu. To view menu options, see [page 322](#).

---

#### **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).

---

**Table 6-104** ACL Menu Options (/cfg/acl/acl x)**Command Syntax and Usage****stats enable | disable**

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>/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 6-105** Ethernet Filtering Menu Options (/cfg/acl/acl x/ethernet)**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** <1-4095> <VLAN mask (0xfff)>

Defines a VLAN number and mask for this ACL.

**etype** ARP | IP | IPv6 | MPLS | RARP | any | 0xXXXX

Defines the Ethernet type for this ACL.

**pri** <0-7>

Defines the Ethernet priority value for the ACL.



**Table 6-105** Ethernet Filtering Menu Options (/cfg/acl/acl x/ethernet)

---

**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 6-106** IP version 4 Filtering Menu Options (/cfg/acl/acl x/ipv4)

---

**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.

---

**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

---

**Table 6-106** IP version 4 Filtering Menu Options (/cfg/acl/acl x/ipv4)

---

**Command Syntax and Usage**

---

**tos** <0-255>

Defines a Type of Service 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 6-107** TCP/UDP Filtering Menu Options (`/cfg/acl/acl x/tcpudp`)

---

### 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:

<u>Number</u>	<u>Name</u>
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)>*

Defines a TCP/UDP flag for the ACL.

---

**Table 6-107** TCP/UDP Filtering Menu Options (/cfg/acl/acl x/tcpudp)**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 6-108** ACL Metering Menu Options (/cfg/acl/acl x/meter)**Command Syntax and Usage****cir** <64-1000000>

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.

**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
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 6-109** ACL Re-mark Menu Options (/cfg/acl/acl x/re-mark)

---

### **Command Syntax and Usage**

---

#### **inprof**

Displays the Re-mark In-Profile Menu. To view menu options, see [page 320](#).

---

#### **outprof**

Displays the Re-mark Out-of-Profile Menu. To view menu options, see [page 322](#).

---

#### **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]	
uplp	- Set Update User Priority Menu
updscp	- Set the update DSCP
reset	- Reset update DSCP settings
cur	- Display current settings

**Table 6-110** ACL Re-Mark In-Profile Menu (/cfg/acl/acl x/re-mark/inprof)

---

### Command Syntax and Usage

---

#### **uplp**

Displays the Re-Mark In-Profile Update User Priority Menu. To view menu options, see [page 321](#).

---

#### **updscp <0-63>**

Sets 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/inprof/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 6-111** ACL Re-Mark User Priority Menu (/cfg/acl/acl x/re-mark/inprof/up1p)

---

### 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 In-Profile User Priority 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 6-112** ACL Re-Mark Out-of-Profile Menu (/cfg/acl/acl x/re-mark/outprof)

### Command Syntax and Usage

#### **updscp** <0-63>

Sets the DiffServ Code Point (DSCP) of Out-of-Profile packets to the selected value. The switch sets the DSCP value on Out-of-Profile packets.

#### **reset**

Resets the update DSCP parameters for Out-of-Profile packets to their default values.

#### **cur**

Displays current Re-Mark Out-of-Profile parameters.

## **/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 6-113** ACL Packet Format Filtering Menu Options (/cfg/acl/acl x/pktfmt)

### Command Syntax and Usage

#### **ethfmt** eth2 | SNAP | LLC

Defines the Ethernet format for the ACL.

#### **tagfmt** none | tagged

Defines the tagging format for the ACL.

#### **ipfmt** none | v4 | v6

Defines the IP format for the ACL.



**Table 6-113** ACL Packet Format Filtering Menu Options (/cfg/acl/acl x/pktfmt)

---

**Command Syntax and Usage**

---

**reset**

Resets Packet Format parameters for the ACL to their default values.

---

**cur**

Displays the current Packet Format parameters for the ACL.

---

## **/cfg/acl/group** <ACL Group number> **ACL Group Configuration**

```
[ACL Group 1 Menu]
add      - Add ACL to group
rem      - Remove ACL from group
cur      - Display current ACL items in 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 6-114** ACL Group Menu Options (/cfg/acl/group x)

---

**Command Syntax and Usage**

---

**add acl** <1-896>

Adds the selected ACL to the ACL Group.

---

**rem acl** <1-896>

Removes the selected ACL from the ACL Group.

---

**cur**

Displays the current ACL group parameters.

---

## /cfg/pmirr

# Port Mirroring Configuration

---

```
[Port Mirroring Menu]
  mirror - Enable/Disable Mirroring
  monport - Monitoring Port based PM Menu
  cur     - Display All Mirrored and Monitoring Ports
```

Port mirroring is disabled by default. For more information about port mirroring on the GbE Switch Module, see “Appendix A: Troubleshooting” in the *Alteon OS Application Guide*.

---

**NOTE** – Traffic on VLAN 4095 is not mirrored to the external ports.

---

The Port Mirroring Menu is used to configure, enable, and disable the monitored 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 6-115** Port Mirroring Menu Options (/cfg/pmirr)

---

### Command Syntax and Usage

---

**mirror** **disable** | **enable**

Enables or disables port mirroring

---

**monport** <port alias or number>

Displays port-mirroring menu. To view menu options, see [page 325](#).

---

**cur**

Displays current settings of the mirrored and monitoring ports.

---

## /cfg/pmirr/monport

### Port-Mirroring Configuration

[Port EXT1 Menu]	
add	- Add "Mirrored" port
rem	- Rem "Mirrored" port
delete	- Delete this "Monitor" port
cur	- Display current Port-based Port Mirroring configuration

**Table 6-116** Port Mirroring Monitor Port Menu Options (/cfg/pmirr/monport)

---

#### 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 mirrored 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.

---

## /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 [Chapter 2, “First-Time Configuration.”](#)

## /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 327](#).

`/cfg/ptcfg <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 TFTP server. To start the switch configuration upload, at the `Configuration#` prompt, enter:

```
Configuration# ptcfg <TFTP server> <filename>
```

Where *server* is the TFTP server IP address or hostname, and *filename* is the name of the target script configuration file.

---

**NOTE** – 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 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 <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 <TFTP server> <filename>
```

Where *server* is the TFTP server IP 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
prm      - Protected Mode Menu
passwd   - Change current user password
clrlog   - Clear syslog messages
conlog   - Enable/Disable Session Console Logging
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 7-1** Operations Menu (/oper)

---

### Command Syntax and Usage

---

**port** <port alias or number>

Displays the Operational Port Menu. To view menu options, see [page 332](#).

---

**vrrp**

Displays the Operational Virtual Router Redundancy Menu. To view menu options, see [page 334](#).

---

**ip**

Displays the IP Operations Menu, which has one sub-menu/option, the Operational Border Gateway Protocol Menu. To view menu options, see [page 334](#).

---

**prm**

Displays the Protected Mode menu. To view menu options, see [page 336](#).

---

**passwd** <15 char max>

Allows the user to change the password. You need to enter the current password in use for validation.

---

**clrlog**

Clears all Syslog messages.

---

**conlog enable|disable**

Enables or disables console logging of the current session.

---



**Table 7-1** Operations Menu (/oper)

---

**Command Syntax and Usage**

---

**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.

---

## `/oper/port` *<port alias or number>* **Operations-Level Port Options**

```
[Operations Port INT1 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 7-2** Operations-Level Port Menu Options (`/oper/port`)

---

### Command Syntax and Usage

---

#### **8021x**

Displays the 802.1x Port Menu. To view menu options, see [page 333](#).

---

#### **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 7-3** Operations-Level Port 802.1x Menu Options (`/oper/port x/8021x`)

---

### 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`.

---

**/oper/vrrp****Operations-Level VRRP Options.**

<pre>[VRRP Operations Menu]   back    - Set virtual router to backup</pre>
--

**Table 7-4** Operations-Level VRRP Menu Options (/oper/vrrp)**Command Syntax and Usage****back** <virtual router number (1-1024)>

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**

<pre>[IP Operations Menu]   bgp      - Operational Border Gateway Protocol Menu</pre>
---

**Table 7-5** Operations-Level IP Menu Options (/oper/ip)**Command Syntax and Usage****bgp**

Displays the Border Gateway Protocol Operations Menu. To view the menu options see [page 335](#).

## /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 7-6** Operations-Level BGP Menu Options (/oper/ip/bgp)

---

#### 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/prm

### Protected Mode Options

```
[Protected Mode Menu]
  mgt - Enable/disable local control of external management
  ext - Enable/disable local control of external ports
  fact - Enable/disable local control of factory default reset
  mif - Enable/disable local control of Mgmt VLAN interface
  on - Turn on/alter protected mode by applying enabled features
  off - Turn off protected mode by removing all features
  cur - Display current PRM configuration
```

Protected Mode is used to secure certain switch management options, so they cannot be changed by the management module.

**Table 7-7** Protected Mode Options (/oper/prm)

---

#### Command Syntax and Usage

---

##### **mgt enable|disable**

Enables exclusive local control of switch management. When Protected Mode is set to **on**, the management module cannot be used to disable external management on the switch. The default value is **enabled**.

**Note:** Due to current management module implementation, this setting cannot be disabled.

---

##### **ext enable|disable**

Enables exclusive local control of external ports. When Protected Mode is set to **on**, the management module cannot be used to disable external ports on the switch. The default value is **enabled**.

**Note:** Due to current management module implementation, this setting cannot be disabled.

---

##### **fact enable|disable**

Enables exclusive local control of factory default resets. When Protected Mode is set to **on**, the management module cannot be used to reset the switch software to factory default values. The default value is **enabled**.

**Note:** Due to current management module implementation, this setting cannot be disabled.

---

##### **mif enable|disable**

Enables exclusive local control of the management interface (IF 128). When Protected Mode is set to **on**, the management module cannot be used to configure parameters for the management interface. The default value is **enabled**.

**Note:** Due to current management module implementation, this setting cannot be disabled.

---

##### **on**

Turns Protected Mode **on**. When Protected Mode is turned on, the switch takes exclusive local control of all enabled options.

---

**Table 7-7** Protected Mode Options (/oper/prm)

---

**Command Syntax and Usage**

---

**off**

Turns Protected Mode **off**. When Protected Mode is turned off, the switch relinquishes exclusive local control of all enabled options.

---

**cur**

Displays the current Protected Mode configuration.

---





## 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 Menu, you can use a Web browser or SNMP to work with switch image and configuration files. To use SNMP, refer to [“Working with Switch Images and Configuration Files”](#) on page 378.

## /boot

# Boot Menu

---

```
[Boot Options Menu]
  sched - Scheduled Switch Reset Menu
  image - Select software image to use on next boot
  conf  - Select config block to use on next boot
  mode  - Select CLI mode to use on next boot
  prompt - Prompt for selectable boot mode
  gting - Download new software image via TFTP
  pting - 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.

## Scheduled Reboot of the Switch

---

This feature allows the switch administrator to schedule a reboot to occur at a particular time in 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 with the help of the following sub-menu:

## /boot/sched

### Scheduled Reboot Menu

```
[Boot Schedule Menu]
  set      - Set switch reset time
  cancel   - Cancel pending switch reset
  cur      - Display current switch reset schedule
```

## Updating the Switch Software Image

---

The switch software image is the executable code running on the GbE Switch Module. 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. To get the latest version of software available for your GbE Switch Module, go to:

<http://www-304.ibm.com/jct01004c/systems/support>

Click on **software updates**. 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.

## Using the BBI

You can use the Browser-Based Interface to load software onto the GbESM. The software image to load can reside in one of the following locations:

- FTP server
- TFTP server
- Local computer

After you log onto the BBI, perform the following steps to load a software image:

1. **Click the Configure context button in the toolbar.**
2. **In the Navigation Window, select System > Config/Image Control.**

The Switch Image and Configuration Management page appears.

Switch Image and Configuration Management	
Image 1 Version	version 1.2.0, downloaded 16:51:09 Sun Jan 8, 2007
Image 2 Version	version 1.2.1, downloaded 14:08:11 Fri Jan 6, 2007
Boot Version	version 1.2.0
Active Image Version	1.2.0
Next Boot Image Selection	image 1 ▾
Active Configuration Block	active config
Next Boot Configuration Block Selection	active config ▾
Next CLI Boot Mode Selection	AOS CLI ▾
Prompt for selectable boot mode	DISABLE ▾
<u>FTP/TFTP Settings</u>	
Hostname or IP Address of FTP/TFTP server	100.10.20.1
Username for FTP Server or Blank for TFTP Server	
Password for FTP Server	
<u>Image Settings</u>	
Image for Transfer	image 1 ▾
Image Filename (on server)	1.2.1_OS.img
Image Filename (on HTTP Client)	
	<input type="button" value="Get Image"/> <input type="button" value="Put Image"/> <input type="button" value="Browse..."/> <input type="button" value="Download via Browser"/>

3. If you are loading software from your computer (HTTP client), go to step 4. If you are loading software from a FTP/TFTP server, enter the server's information in the FTP/TFTP Settings section.
4. In the Image Settings section, select the image version you want to replace (Image for Transfer).
  - If you are loading software from a FTP/TFTP server, enter the file name and click Get Image.
  - If you are loading software from your computer, click Browse. In the File Upload Dialog, select the file and click OK. Click Download via Browser.

Once the image has loaded, the page refreshes to show the new software.

## Using the CLI

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 IP 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 297](#).

---

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# gting
```

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 IP 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 IP 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 1.1.1  
that was downloaded at 0:23:39 Thu Jan 1, 2007.  
Upload will transfer image2 (2788535 bytes) to file "image1"  
on FTP/TFTP server 1.90.90.95.  
Confirm upload operation (y/n) ? y
```

## Selecting a Configuration Block

---

When you make configuration changes to the GbE Switch Module, 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 GbE Switch Module 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 GbE Switch Module 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.

---

---

**NOTE** – Resetting the switch causes the date and time to revert to default values. Use `/cfg/sys/date` and `/cfg/sys/time` to reenter the current date and time.

---

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 GbESM is the Alteon OS CLI. To access the ISCLI, enter the following command and reset the GbESM:

```
Main# boot/mode iscli
```

To access the Alteon OS CLI, enter the following command from the ISCLI and reload the GbESM:

```
Router(config)# boot cli-mode aos
```

Users can select the CLI mode upon login, if the `/boot/prompt` command is enabled. Only an administrator connected through the console port 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.



## 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
  arp      - ARP Cache Manipulation Menu
  route    - IP Route Manipulation Menu
  igmp     - IGMP Multicast Group Menu
  uudmp    - Uencode FLASH dump
  ptdmp    - Upload FLASH dump via FTP/TFTP
  cldmp    - Clear FLASH dump
  panic    - Dump state information to FLASH and reboot
  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 GbE Switch Module after any one of the following occurs:

- The switch administrator forces a switch *panic*. The `panic` option, found in the Maintenance Menu, causes the switch to dump state information to flash memory, and then causes the switch to reboot.
- 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 9-1** Maintenance Menu (`/maint`)

---

### Command Syntax and Usage

---

#### **sys**

Displays the System Maintenance Menu. To view menu options, see [page 352](#).

---

#### **fdb**

Displays the Forwarding Database Manipulation Menu. To view menu options, see [page 353](#).

---

#### **debug**

Displays the Debugging Menu. To view menu options, see [page 354](#).

---

#### **arp**

Displays the ARP Cache Manipulation Menu. To view menu options, see [page 355](#).

---

**Table 9-1** Maintenance Menu (/maint)

---

**Command Syntax and Usage**

---

**route**

Displays the IP Route Manipulation Menu. To view menu options, see [page 356](#).

---

**igmp**

Displays the IGMP Maintenance Menu. To view menu options, see [page 357](#).

---

**uudmp**

Displays dump information in uuencoded format. For details, see [page 360](#).

---

**ptdmp hostname, filename [-mgmt|-data]**

Saves the system dump information via TFTP. For details, see [page 361](#).

---

**cldmp**

Clears dump information from flash memory. For details, see [page 361](#).

---

**panic**

Dumps MP information to FLASH and reboots. For details, see [page 362](#).

---

**tsdmp**

Dumps all GbE Switch Module 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 IBM Service Support. The options are used to perform system debugging.

```
[System Maintenance Menu]
  flags   - Set NVRAM flag word
  tmask   - Set MP trace mask word
```

**Table 9-2** System Maintenance Menu Options (`/maint/sys`)

---

### Command Syntax and Usage

---

**flags** *<new NVRAM flags word as 0XXXXXXXX>*

This command sets the flags that are used for debugging purposes by Tech support group.

**tmask** *<new trace mask word as 0XXXXXXXX>* [**p**]

This command sets the trace mask that is used for debugging purposes by Tech support group.

---

## /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
```

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 9-3** FDB Manipulation Menu Options (/maint/fdb)

---

### 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 `xx:xx:xx:xx:xx:xx` format (such as `08:00:20:12:34:56`) or `xxxxxxxxxxxx` format (such as `080020123456`).

---

**port** <port alias or number>

Displays all FDB entries for a particular port.

---

**vlan** <VLAN number (1-4095)>

Displays all FDB entries on a single VLAN.

---

**dump**

Displays all entries in the Forwarding Database. For details, see [page 77](#).

---

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

Removes a single FDB entry.

---

**clear**

Clears the entire Forwarding Database from switch memory.

---

## **/maint/debug**

### **Debugging Options**

[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 IBM Service Support.

**Table 9-4** Miscellaneous Debug Menu Options (/maint/debug)

---

#### **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 25, 2001; 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/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 9-5** ARP Maintenance Menu Options (/maint/arp)

---

#### 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 [page 100](#).

---

## /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 9-6** IP Route Manipulation Menu Options (/maint/route)

---

#### 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 4-24 on page 98](#)

---

**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 4-25 on page 99](#)

---

**if** <interface number (1-128)>

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 97](#).

---

## /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 9-7](#) describes the IGMP Maintenance commands.

**Table 9-7** IGMP Maintenance Menu Options (/maint/igmp)

---

#### Command Syntax and Usage

---

##### **group**

Displays the Multicast Group menu. To view menu options, see [page 358](#).

---

##### **mrouter**

Displays the Multicast Router Port menu. To view menu options, see [page 359](#).

---

##### **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
```

The following table describes the IGMP Maintenance commands.

**Table 9-8** IGMP Multicast Group Maintenance Menu Options (/maint/igmp/group)

---

#### 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 Group 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
```

The following table describes the IGMP multicast router (Mrouter) maintenance commands.

**Table 9-9** IGMP Mrouter Maintenance Menu Options (`/maint/igmp/mrouter`)

---

### 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/uudmp` **Uencode 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 361](#).

---

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** <server> <filename>

## TFTP System Dump Put

Use this command to put (save) the system dump to a TFTP server.

---

**NOTE** – If the 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 TFTP, at the Maintenance# prompt, enter:

```
Maintenance# ptdmp <server> <filename>
```

Where *server* is the TFTP server IP address or hostname, and *filename* is the target dump file.

**/maint/cldmp**

## 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.
```

## `/maint/panic` Panic Command

The `panic` command causes the switch to immediately dump state information to flash memory and automatically reboot.

To select `panic`, at the `Maintenance#` prompt, enter:

```
>> Maintenance# panic
A FLASH dump already exists.
Confirm replacing existing dump and reboot [y/n]:
```

Enter **y** to confirm the command:

```
Confirm dump and reboot [y/n]: y
```

The following messages are displayed:

```
Starting system dump...done.

Rebooted because of PANIC command.
Booting complete 0:01:01 Tue Mar 14, 2007:
Version 1.1.0 from FLASH imagel, active config block.

No POST errors (0xff).

Production Mode.
```

## 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 Tuesday March 14, 2007. 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.
```



## APPENDIX A

# Alteon OS Syslog Messages

---

The following syntax is used when outputting syslog messages:

```
<Time stamp><Log Label>Web OS<Thread ID> : <Message>
```

where

- **<Timestamp>**

The time of the message event is displayed in month day hour:minute:second format. For example: Aug 19 14:20:30

- **<Log Label>**

The following types of log messages are recorded: LOG\_EMERG, LOG\_ALERT, LOG\_CRIT, LOG\_ERR, LOG\_WARNING, LOG\_NOTICE, LOG\_INFO, and LOG\_DEBUG

- **<Thread ID>**

This is the software thread that reports the log message. The following thread IDs are recorded: stg, ip, console, telnet, vrrp, system, web server, ssh, and bgp

- **<Message>**: The log message

Following is a list of potential syslog messages. To keep this list as short as possible, only **<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\_WARNING

**FILTER** “filter *<filter number>* fired on port *<port number>*, *<source IP address>* -> *<destination IP address>*, [*<ICMP type>*], [*<IP protocol>*], [*<TCP flags>*]”

## LOG\_ALERT

STP	Own BPDU received from port <port_id>
STP	STG <stg>, topology change detected
STP	CIST topology change detected
STP	STG <stg>, new root bridge
STP	CIST new root bridge
IP	Cannot contact default gateway <ip_address>
VRRP	Received errored advertisement from <ip_address>
VRRP	Received incorrect password from <ip_address>
VRRP	Received incorrect addresses from <ip_address>
VRRP	Received incorrect advertisement interval <seconds> from <ip_address>
VRRP	Synchronization from non-configured peer <ip_address>
VRRP	Synchronization from non-configured peer <ip_address> was blocked
BGP	Notification (<reason>) received from <BGP peer ip_address>
BGP	Session with <BGP peer ip_address> failed (<reason>)
SFP	Inserted at port EXT<num> is UNAPPROVED! Port is DISABLED.
SFP	Removed at port EXT<num>
SFP	Inserted at port EXT<num>

## LOG\_CRITICAL

SSH	Can't allocate memory in load_MP_INT
SSH	Currently not enough resource for loading RSA private key
SSH	Currently not enough resource for loading RSA public key
SYSTEM	Temperature exceeds threshold
SFP	Failed to Read SFP ID for port EXT<num>
SFP	Failed to Select SFP for port EXT<num> ID
SFP	Voltage (<volt>) is UNDER Range on port EXT<num>. Port is DISABLED
SFP	Voltage (<volt>) is OVER Range on port EXT<num>
SFP	Failed to Read SFP Voltage Temperature for port EXT<num>
SFP	Failed to Select SFP for port EXT<num> voltage temperature.
SFP	Temperature (<temp>) is UNDER OVER Range on port EXT<num>
SFP	Poll SFP Failed to get SFP Status
SFP	Inserted at port EXT<num> has I2C FAILURE! Port is DISABLED.
SFP	TX Fault on port EXT<num>. Port is DISABLED.

## LOG\_ERROR

MGMT	PANIC at <file>:<line> in thread <thread id>
MGMT	VERIFY at <file>:<line> in thread <thread id>
MGMT	ASSERT at <file>:<line> in thread <thread id>
NTP	Cannot contact <primary secondary> NTP server <ip_address>
NTP	Unable to listen to NTP port
STP	Error: Error writing STG config to FLASH
STP	Error: Error writing config to FLASH
MGMT	Apply not done
MGMT	Save not done
MGMT	<apply save diff> is issued by another user. Try later.
CLI	Error: Error writing %s config to FLASH
CLI	New Path Cost for Port <port_id> is invalid
CLI	PVID <vlan_id> for port <port_id> is not created
CLI	RADIUS secret must be 1-32 characters long
CLI	Please configure primary RADIUS server address
CLI	STP changes can't be applied since STP is OFF
CLI	Trunk group <trunk_id> contains ports with different PVIDs
CLI	Trunk group <trunk_id> has more than <max_trunk_ports> ports
CLI	Trunk group <trunk_id> contains no ports but is enabled
CLI	Not all ports in trunk group <trunk_id> are in VLAN <vlan_id>
CLI	Trunk groups <trunk_id> and <trunk_id> can not share the same port

## LOG\_ERROR (continued)

PORT_MIRR	Port Mirroring changes are not applied
CLI	Broadcast address for IP interface <interface_id> is invalid
CLI	IP Interfaces <interface_id> and <interface_id> are on the same subnet
MGMT	Unapplied changes reverted
MGMT	Unsaved changes reverted
CLI	SNMP source trap interface <IF> is not enabled
CLI	Password already taken
CLI	Radius is already turned ON
CLI	Cannot ena/dis primary admin user
CLI	Cannot change primary admin COS
CLI	Cannot change primary admin username
CLI	Cannot delete primary admin
CLI	Error: Enabled user <user> has no username
CLI	Error: Enabled user <user> has no password
CLI	New combination of Bridge Timers for STG <group> is invalid
CLI	Need maxage <= 2*(frwd-1) and maxage >= 2*(hello+1)
CLI	Multiple VLAN members in non default STG <group>
CLI	Duplicate VLAN members in STGs <gr1> and <gr2>
CLI	VRRP hot-standby port (<port>) is part of a STG (<group>) with STP turned on
CLI	Error writing active config to FLASH! - Another save is in progress -OR- - Configuration is too large -OR- - Unknown error

## LOG\_ERROR (continued)

CLI	A previous apply is being executed. Try later.
CLI	RADIUS secret must be 1-<len> characters long
CLI	Please configure primary RADIUS server address.
CLI	TACACS+ secret must be 1-<len> characters long
CLI	Please configure primary TACACS+ server address.
CLI	Port Mirroring changes are not applied
VRRP	cfg_sync_tx_putsn: ABORTED
VRRP	Synchronization RX connection RESET.
VRRP	Synchronization RX connection TIMEOUT.
VRRP	Synchronization RX connection UNKNOWN CLOSE.
VRRP	Synchronization RX connection UNREACHABLE.
VRRP	Synchronization TX Error.
VRRP	Synchronization TX connection RESET.
VRRP	Synchronization TX connection TIMEOUT.
VRRP	Synchronization TX connection UNREACHABLE.
VRRP	Synchronization TX connection UNKNOWN CLOSE.
VRRP	Synchronization connection RCLOSE by peer.
VRRP	Synchronization connection Wait-For-Close Timeout.
VRRP	Synchronization connection Transmit Timeout.
VRRP	Synchronization Receive Timeout

## LOG\_ERROR (continued)

VRRP	Synchronization Receive UNKNOWN Timeout
VRRP	Sync receive in progress ... cannot start Sync
VRRP	Sync already in progress ... cannot start Sync
VRRP	Config Sync route find error.
VRRP	Config Sync tcp_open error.
VRRP	Config Synchronization Timeout - Resuming Console thread
VRRP	New configuration did not validate (rc=<code>)
VRRP	New configuration did not apply (rc=<code>)
VRRP	Sync config apply error.
VRRP	Attempting to redirect a previously redirected input
VRRP	Sync rx tcp open Error
VRRP	Sync Version/Password Failed-No Version/Password Line
VRRP	Sync Version Failed - peer:<host> config:<version>
VRRP	Sync Password Failed-Bad Password
VRRP	Sync of switches of different hardware types is not supported
VRRP	Synchronization connection RCLOSE before RX.
VRRP	Sync transmit already in progress ... cannot start Sync
VRRP	Sync receive in progress ... cannot start Sync
VRRP	Sync receive already in progress ... cannot start Sync receive
VRRP	Sync transmit in progress ... cannot start Sync receive

## LOG\_ERROR (continued)

VRRP	Multiple static routes have same destination
VRRP	Virtual router <vr_id> must have sharing disabled when hotstandby is enabled
VRRP	Virtual router group must be enabled when hotstandby is enabled
VRRP	At least one virtual router must be enabled when group is enabled
VRRP	Virtual router group must have sharing disabled when hotstandby is enabled
VRRP	Virtual router group must have pre-emption enabled when hotstandby is enabled
VRRP	Virtual router <vr_id> must have an IP address
VRRP	Virtual router <vr_id> cannot have same VRID and VLAN as <vlan_id>
VRRP	Virtual router <vr_id> cannot have same IP address as <ip_address>
VRRP	Virtual router <vr_id> corresponding virtual server <server_id> is not enabled
CLI	Duplicate default entry
CLI	BGP peer <bgp_peer_id> must have an IP address
CLI	BGP peers <bgp_peer_id> and <bgp_peer_id> have same address
CLI	BGP peer <bgp_peer_id> have same address as IP interface <ip_interface_id>
CLI	BGP peer <bgp_peer_id> IP interface <ip_interface_id> is not enabled

## LOG\_NOTICE

SYSTEM	Rebooted <last_reset_information>
SYSTEM	Rebooted <last_reset_information> administrator logged in
SYSTEM	Enable auto negotiation for copper GIG port: <port>
SYSTEM	Change fiber GIG port <port> mode to full duplex
SYSTEM	Change fiber GIG port <port> speed to 1000
MGMT	Boot config block changed
MGMT	Boot image changed
MGMT	Switch reset from CLI
MGMT	Syslog host changed to <ip_address>
MGMT	Syslog host changed to this host



## LOG\_NOTICE (continued)

MGMT	Second syslog host changed to <ip_address>
MGMT	Second syslog host changed to this host
MGMT	Next boot will use active config block
MGMT	User password changed
MGMT	Operator password changed
MGMT	Administrator password changed
MGMT	RADIUS server timeouts
MGMT	Failed login attempt via TELNET from host %s
MGMT	Failed login attempt via the CONSOLE
MGMT	PASSWORD FIX-UP MODE IN USE
MGMT	<login_level> login on Console
MGMT	" <login_level> <"idle timeout" "logout"> from Console"
MGMT	" <login_level> <"connection closed" "idle timeout" "logout"> from"
MGMT	Administrator logout from BBI
MGMT	<login_level> login from host <ip_address>
MGMT	System clock set to <time>
MGMT	PANIC command from CLI
MGMT	Switch reset scheduled at <time>
MGMT	Switch reset at <time> has been cancelled
MGMT	Scheduled switch reboot

## LOG\_NOTICE (continued)

MGMT	<mins> minutes until scheduled reboot
MGMT	Password for <user> changed by <user>, notifying admin to save.
MGMT	Temperature OK
VLAN	Default VLAN can not be deleted
IP	" default gateway <ip_address> <"enabled" "disabled">"
IP	Default gateway <ip_address> operational
SSH	scp <login_level> login
SSH	" scp <login_level> <"connection closed" "idle time-out" "logout">"
PORT_MIRR	Port mirroring is enabled
PORT_MIRR	Port mirroring is disabled
SYSTEM	Management Port enabled/disabled state can only be controlled by Management Module.
SYSTEM	Management Port can only be enabled/disabled by the Management Module
SYSTEM	Cannot change the Management IP Interface VLAN
SYSTEM	Cannot enable/disable the Management IP Interface
SYSTEM	Cannot enable/disable forwarding on Management IP Interface
SYSTEM	Cannot delete the Management IP Interface
SYSTEM	Management VLAN can not be disabled
SYSTEM	Default VLAN can not be deleted
SYSTEM	Management VLAN can not be deleted
SYSTEM	Management Port enabled/disabled state can only be controlled by Management Module.

## LOG\_NOTICE (continued)

SYSTEM	Management Port can only be enabled/disabled by the Management Module
SYSTEM	Cannot change the Management IP Interface VLAN
SYSTEM	Cannot enable/disable the Management IP Interface
SYSTEM	Cannot enable/disable forwarding on Management IP Interface
SYSTEM	Cannot delete the Management IP Interface
SYSTEM	Management VLAN can not be disabled
SYSTEM	Default VLAN can not be deleted
SYSTEM	Management VLAN can not be deleted
SYSTEM	Rebooted <cause and time of reboot>
SYSTEM	Management Port cannot be configured as a Monitor Port.
VRRP	Virtual router <ip_address> is now master
VRRP	Virtual router <ip_address> is now backup
BGP	Session established with <BGP_peer_ip_address>

## LOG\_INFO

MGMT	New configuration applied
MGMT	New configuration saved
MGMT	Unsaved changes reverted
MGMT	Could not revert unsaved changes
MGMT	" <image1 image2> downloaded from host <ip_address>, file <file_name> <software_version>"
MGMT	Serial EEPROM downloaded from host <ip_address> file <file_name>
MGMT	<login_level> login on Console
MGMT	" <login_level> <"idle timeout" "logout"> from Console"
MGMT	<login_level> login from host <ip_address>
MGMT	" <login_level> <"connection closed" "idle timeout" "logout"> from Telnet/SSH."

## LOG\_INFO (continued)

MGMT	Unsupported GBIC refused
MGMT	Flash Write Error. Failed to allocate buffer. Quitting
MGMT	Flash Write Error. Trying again
MGMT	Flash Write Error. Failed to allocate buffer. Quitting
MGMT	Flash Write Error
MGMT	FLASH ERROR - invalid address used
SSH	scp <login_level> login
SSH	" scp <login_level> <""connection closed"" ""idle time-out"" ""logout"">"
SSH	Server key autogen starts
SSH	Server key autogen completes
SSH	Server key autogen timer timeouts
VRRP	Synchronizing to <host> ...
VRRP	Config Synchronization Transmit Successful.
VRRP	New configuration validated
VRRP	New configuration applied
VRRP	New configuration did not save (rc=<code>)
VRRP	New configuration saved
VRRP	Restoring Current Config.
VRRP	Synchronizing from <host> ...
VRRP	Config Synchronization Receive Successful.

## Appendix B

# Alteon OS SNMP Agent

---

The Alteon OS SNMP agent supports SNMP version 3. Security is provided through SNMP community strings. The default community strings are “public” for SNMP GET operation and “private” for SNMP SET operation. The community string can be modified only through the Command Line Interface (CLI). Alteon WebSystems is registered as Vendor 1872. Detailed SNMP MIBs and trap definitions of the Alteon OS SNMP agent are contained in the following Alteon OS enterprise MIB document:

GbESM-10U-2223.mib

Users may specify up to two trap hosts for receiving SNMP Traps. The agent will send the SNMP Trap to the specified hosts when appropriate. Traps are not sent if there is no host specified.

Alteon OS SNMP agent supports the following standard MIBs:

- rfc1213.mib
- rfc1215.mib
- rfc1493.mib
- rfc1573.mib
- rfc1643.mib
- rfc1757.mib
- rfc1907.mib
- rfc2037.mib
- rfc2571 .mib
- rfc2572.mib
- rfc2573.mib
- rfc2574.mib
- rfc2575.mib
- rfc2576.mib

Alteon OS SNMP agent supports the following generic traps as defined in RFC 1215:

- ColdStart
- WarmStart
- LinkDown
- LinkUp
- AuthenticationFailure

The SNMP agent also supports two Spanning Tree traps as defined in RFC 1493:

- NewRoot
- TopologyChange

The following are the enterprise SNMP traps supported in Alteon OS:

**Table 9-10** Alteon OS-Supported Enterprise SNMP Traps

Trap Name	Description
altSwPrimaryPowerSupplyFailure	Signifies that the primary power supply failed.
altSwFanFailure	Signifies that the fan has failed.
altSwDefGwUp	Signifies that the default gateway is alive.
altSwDefGwDown	Signifies that the default gateway is down.
altSwDefGwInService	Signifies that the default gateway is up and in service
altSwDefGwNotInService	Signifies that the default gateway is alive but not in service
altSwVrrpNewMaster	The newMaster trap indicates that the sending agent has transitioned to 'Master' state.
altSwVrrpNewBackup	The newBackup trap indicates that the sending agent has transitioned to 'Backup' state.
altSwVrrpAuthFailure	A vrrpAuthFailure trap signifies that a packet has been received from a router whose authentication key or authentication type conflicts with this router's authentication key or authentication type. Implementation of this trap is optional.
altSwLoginFailure	A altSwLoginFailure trap signifies that someone failed to enter a valid username/password combination.

**Table 9-10** Alteon OS-Supported Enterprise SNMP Traps

Trap Name	Description
altSwTcpHoldDown	A altSwTcpHoldDown trap signifies that new TCP connection requests from a particular client will be blocked for a pre-determined amount of time since the rate of new TCP connections from that client has reached a pre-determined threshold.
altSwTempExceedThreshold	A altSwTempExceedThreshold trap signifies that the switch temperature has exceeded maximum safety limits.

## Working with Switch Images and Configuration Files

---

This section describes how to use MIB calls to work with switch images and configuration files. You can use a standard SNMP tool to perform the actions, using the MIBs listed in [Table 9-11](#).

The examples in this section use the MIB name, but you can also use the OID.

[Table 9-11](#) lists the MIBs used to perform operations associated with the GbESM Switch Image and Configuration files. These MIBs are contained within in the file “aossswitch.mib”

**Table 9-11** MIBs for Switch Image and Configuration Files

MIB Name	MIB OID
agTftpServer	1.3.6.1.4.1872.2.5.1.1.7.1.0
agTftpImage	1.3.6.1.4.1872.2.5.1.1.7.2.0
agTftpImageFileName	1.3.6.1.4.1872.2.5.1.1.7.3.0
agTftpCfgFileName	1.3.6.1.4.1872.2.5.1.1.7.4.0
agTftpDumpFileName	1.3.6.1.4.1872.2.5.1.1.7.5.0
agTftpAction	1.3.6.1.4.1872.2.5.1.1.7.6.0
agTftpLastActionStatus	1.3.6.1.4.1872.2.5.1.1.7.7.0
agTftpUserName	1.3.6.1.4.1872.2.5.1.1.7.9.0
agTftpPassword	1.3.6.1.4.1.1872.2.5.1.1.7.10.0
agTftpTSDumpFileName	1.3.6.1.4.1.1872.2.5.1.1.7.11.0

The following SNMP actions can be performed using the MIBs listed in [Table 9-11](#).

- Load a new Switch image (boot or running) from a FTP/TFTP server
- Load a previously saved switch configuration from a FTP/TFTP server
- Save the switch configuration to a FTP/TFTP server
- Save a switch dump to a FTP/TFTP server



## Loading a new switch image

To load a new switch image with the name “MyNewImage-1.img” into image2, follow the steps below. This example assumes you have a FTP/TFTP server at 192.168.10.10.

**1. Set the FTP/TFTP server address where the switch image resides:**

```
Set agTftpServer.0 "192.168.10.10"
```

**2. Set the area where the new image will be loaded:**

```
Set agTftpImage.0 "image2"
```

**3. Set the name of the image:**

```
Set agTftpImageFileName.0 "MyNewImage-1.img"
```

**4. Initiate the transfer. To transfer a switch image, enter 2 (gting):**

```
Set agTftpAction.0 "2"
```

**5. If you are using an FTP server, enter a username:**

```
Set agTftpUserName.0 "MyName"
```

**6. If you are using an FTP server, enter a password:**

```
Set agTftpPassword.0 "MyPassword"
```

## Loading a saved switch configuration

To load a saved switch configuration with the name “MyRunningConfig.cfg” into the switch, follow the steps below. This example assumes you have a TFTP server at 192.168.10.10.

**1. Set the FTP/TFTP server address where the switch Configuration File resides:**

```
Set agTftpServer.0 "192.168.10.10"
```

**2. Set the name of the configuration file:**

```
Set agTftpCfgFileName.0 "MyRunningConfig.cfg"
```

**3. Initiate the transfer. To restore a running configuration, enter 3:**

```
Set agTftpAction.0 "3"
```

**4. If you are using an FTP server, enter a username:**

```
Set agTftpUserName.0 "MyName"
```

**5. If you are using an FTP server, enter a password:**

```
Set agTftpPassword.0 "MyPassword"
```

## Saving the switch configuration

To save the switch configuration to a FTP/TFTP server follow the steps below. This example assumes you have a FTP/TFTP server at 192.168.10.10.

**1. Set the FTP/TFTP server address where the configuration file is saved:**

```
Set agTftpServer.0 "192.168.10.10"
```

**2. Set the name of the configuration file:**

```
Set agTftpCfgFileName.0 "MyRunningConfig.cfg"
```

**3. Initiate the transfer. To save a running configuration file, enter 4:**

```
Set agTftpAction.0 "4"
```

**4. If you are using an FTP server, enter a username:**

```
Set agTftpUserName.0 "MyName"
```

**5. If you are using an FTP server, enter a password:**

```
Set agTftpPassword.0 "MyPassword"
```

## Saving a switch dump

To save a switch dump to a FTP/TFTP server, follow the steps below. This example assumes you have a FTP/TFTP server at 192.168.10.10.

- 1. Set the FTP/TFTP server address where the configuration will be saved:**

```
Set agTftpServer.0 "192.168.10.10"
```

- 2. Set the name of dump file:**

```
Set agTftpDumpFileName.0 "MyDumpFile.dmp"
```

- 3. Initiate the transfer. To save a dump file, enter 5:**

```
Set agTftpAction.0 "5"
```

- 4. If you are using an FTP server, enter a username:**

```
Set agTftpUserName.0 "MyName"
```

- 5. If you are using an FTP server, enter a password:**

```
Set agTftpPassword.0 "MyPassword"
```



# Glossary

---

<b>DIP (Destination IP Address)</b>	The destination IP address of a frame.
<b>Dport (Destination Port)</b>	The destination port (application socket: for example, http-80/https-443/DNS-53)
<b>NAT (Network Address Translation)</b>	Any time an IP address is changed from one source IP or destination IP address to another address, network address translation can be said to have taken place. In general, half NAT is when the destination IP or source IP address is changed from one address to another. Full NAT is when both addresses are changed from one address to another. No NAT is when neither source nor destination IP addresses are translated.
<b>Preemption</b>	In VRRP, preemption will cause a Virtual Router that has a lower priority to go into backup should a peer Virtual Router start advertising with a higher priority.
<b>Priority</b>	In VRRP, the value given to a Virtual Router to determine its ranking with its peer(s). Minimum value is 1 and maximum value is 254. Default is 100. A higher number will win out for master designation.
<b>Proto (Protocol)</b>	The protocol of a frame. Can be any value represented by a 8-bit value in the IP header adherent to the IP specification (for example, TCP, UDP, OSPF, ICMP, and so on.)
<b>SIP (Source IP Address)</b>	The source IP address of a frame.
<b>SPort (Source Port)</b>	The source port (application socket: for example, HTTP-80/HTTPS-443/DNS-53).
<b>Tracking</b>	<p>In VRRP, a method to increase the priority of a virtual router and thus master designation (with preemption enabled). Tracking can be very valuable in an active/active configuration. You can track the following:</p> <ul style="list-style-type: none"><li>■ ifs: Active IP interfaces on the GbE Switch Module (increments priority by 2 for each)</li><li>■ ports: Active ports on the same VLAN (increments priority by 2 for each)</li><li>■ vrs: Number of virtual routers in master mode on the switch</li></ul>

<b>VIR (Virtual Interface Router)</b>	A VRRP address that is an IP interface address shared between two or more virtual routers.
<b>Virtual Router</b>	A shared address between two devices utilizing VRRP, as defined in RFC 2338. One virtual router is associated with an IP interface. This is one of the IP interfaces that the switch is assigned. All IP interfaces on the GbE Switch Module must be in a VLAN. If there is more than one VLAN defined on the GbE Switch Module, then the VRRP broadcasts will only be sent out on the VLAN of which the associated IP interface is a member.
<b>VRID (Virtual Router Identifier)</b>	<p>In VRRP, a value between 1 and 1024 that is used by each virtual router to create its MAC address and identify its peer for which it is sharing this VRRP address. The standard VRRP MAC address as defined in the RFC is 00-00-5E-00-01-<code>{VRID}</code>. For virtual routers with a VRID greater than 255, the following block of MAC addresses is allocated: 00:0F:6A:9A:40:00 - 00:0F:6A:9A:47:FF</p> <p>If you have a VRRP address shared between two switches, then the VRID must be identical on both switches so each virtual router on each switch knows with whom to share.</p>
<b>VRRP (Virtual Router Redundancy Protocol)</b>	<p>A protocol that acts very similarly to Cisco's proprietary HSRP address sharing protocol. The reason for both of these protocols is so devices have a next hop or default gateway that is always available. Two or more devices sharing an IP interface are either advertising or listening for advertisements. These advertisements are sent via a broadcast message to an address such as 224.0.0.18.</p> <p>With VRRP, one switch is considered the master and the other the backup. The master is always advertising via the broadcasts. The backup switch is always listening for the broadcasts. Should the master stop advertising, the backup will take over ownership of the VRRP IP and MAC addresses as defined by the specification. The switch announces this change in ownership to the devices around it by way of a Gratuitous ARP, and advertisements. If the backup switch didn't do the Gratuitous ARP the Layer 2 devices attached to the switch would not know that the MAC address had moved in the network. For a more detailed description, refer to RFC 2338.</p>

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