Using ACLI and EDM on Avaya Ethernet Routing Switch 4000 Series

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Chapter 1: Introduction

Purpose

This document provides information on the Fundamentals for the Avaya Ethernet Routing Switch 4000 Series Documentation for Release 5.7.

Related resources

Documentation

For a list of the documentation for this product, see *Documentation Reference for Avaya Ethernet Routing Switch 4000 Series*, NN47205–101.

Training

Ongoing product training is available. For more information or to register, see http://avaya-learning.com/.

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Course code	Course title
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Before you begin

- Download the documentation collection zip file to your local computer.
- You must have Adobe Acrobat or Adobe Reader installed on your computer.

Procedure

1. Extract the document collection zip file into a folder.
2. Navigate to the folder that contains the extracted files and open the file named <*product_name_release*>.pdx, for example, ers4000_5.7x.pdx.
3. In the Search dialog box, select the option **In the index named <*product_name_release*>.pdx**.
4. Enter a search word or phrase.
5. Select any of the following to narrow your search:
   - Whole words only
   - Case-Sensitive
   - Include Bookmarks
   - Include Comments

6. Click **Search**.
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Chapter 2: New in this release

The following sections detail what is new in *Using ACLI and EDM on Avaya Ethernet Routing Switch 4000 Series*, NN47205-102 for release 5.7.

Features

For information about changes for this release that apply to features, see the following sections.

Show FLASH History

The FLASH history provides the current status of the FLASH device. Use the **`show flash history command`** to view the FLASH writes and erase history on a standalone unit or stack. The FLASH history does not record programming done from the diagnostics or bootloader. FLASH history is stored in system FLASH. The data does not get corrupted during an upgrade or downgrade. FLASH History is automatically enabled and does not require any configuration.

Note:

Recording of FLASH history begins after upgrading the ERS 4000 to Release 5.7. FLASH events that occurred prior to Release 5.7 are unknown to this feature.

For more information, see Job aid tabs in the File System work area on page 48.

Link State Tracking

Link-state tracking (LST) binds the link state of multiple interfaces. The Link-state tracking feature identifies the upstream and downstream interfaces. The associations between these two interfaces form link-state tracking group.

For more information about the LST path on EDM and ACLI commands, see Job aid folders and subfolders in the navigation tree on page 48.

List command

The `show cli list` command displays ACLI commands for each mode. Additionally, `show cli list verbose` command lists the ACLI syntax for each command. For more information, see ACLI help on page 26.

Run Scripts

According to Avaya best practices for converged solutions, you can use the scripts to configure the parameters for an Avaya stackable Ethernet Switch. The scripts can be executed in a default or verbose mode.

In the automated or non-verbose mode, the switch is configured using predetermined parameter values. In the verbose mode, the script guides you to configure the parameters where the values must be provided as inputs when the script is executed.

In this release, run scripts are available in non-verbose and verbose mode for IP Office, and verbose mode for Link Layer Discovery Protocol (LLDP) and Auto Detect Auto Configuration (ADAC).

For more information about the Run scripts path on EDM and ACLI commands, see Job aid folders and subfolders in the navigation tree on page 48.

NEAP IP Phone support enhancement

NEAP IP Phone support is enhanced to recognize the following Avaya handset models through DHCP signature: 9611G, 9621,9641,9610, 9620L,9620C, 9630G,9650G.

SLA Monitor

ERS 4000 R5.7 supports SLA Mon™ Agent which provides network quality of service (QoS) monitoring and DSCP monitoring capabilities. R5.7 supports the ability to perform QoS and DSCP tests via CLI between any two Networking devices with SLA Mon™ Agents without need for an SLA Mon™ server. In addition, R5.7 supports secure agent-server communication through certificate-based authentication and encrypted agent-server communication secure communications, and is intended to interoperate with the Avaya Diagnostic Server R2.0 when it releases. Avaya Diagnostic Server will provide network-wide QoS and DSCP monitoring, along with graphical display, alarms and alerts, trend analysis, and logging.

For more information about the SLA Monitor path on EDM and ACLI commands, see Job aid folders and subfolders in the navigation tree on page 48.

For more information about the Avaya diagnostic Server, see Avaya Sales Portal under Support Advantage (reference Avaya Diagnostic Server).

SPBM

Shortest Path Bridging MAC (SPBM) is a next generation virtualization technology that revolutionizes the design, deployment and operations of Ethernet networks. SPBM enables massive scalability while simultaneously reducing the complexity of the network.

Avaya networking products allow virtualization services at both layer 2 and layer 3, referred to as L2VSN and L3VSN. The Avaya Ethernet Switch 4800 is capable of providing L2VSN support connecting traditional Ethernet networks to an SPBM enabled network core, the ERS 4800 functions as a Backbone Edge Bridge. The 5.7 release introduces L2VSN capabilities to the ERS 4800 product, whereas SPBM support is exclusive to the ERS 4800 and stacks of ERS 4800. The L3 (e.g. OSPF) features of the ERS 4800 cannot be supported simultaneously with SPBM, they are mutually exclusive.

Avaya ERS 4800 Series supports the IEEE 802.1aq standard of SPBM, which allows for larger Layer 2 topologies and permits faster convergence.

Note:

SPBM is not supported on the ERS 4500 series or hybrid stacks of ERS 4500 and ERS 4800.

For more information regarding configuration and caveats using SPBM with release 5.7, see Job aid folders and subfolders in the navigation tree on page 48, *Avaya Ethernet Routing Switch 4800 Series Configuration - SPBM* (NN47205-507) and *Release Notes for Avaya Ethernet Routing Switch 4000 Series* (NN47205-400).

CFM

SPBM network needs a mechanism to debug connectivity issues and to isolate faults. Connectivity Fault Management (CFM) operates at Layer 2 and provides an equivalent of ping and traceroute. To support troubleshooting of the SPBM cloud, Avaya Ethernet Routing switch 4800 Series supports a subset of CFM functionality. CFM is based on the IEEE 802.1ag standard. IEEE 802.1ag CFM provides Operations, Administration, Management (OAM) tools for the service layer, which allows you to monitor and troubleshoot an end-to-end Ethernet service instance. CFM is the standard for Layer 2 ping, Layer 2 traceroute, and the end-to-end connectivity check of the Ethernet network.

On Avaya Ethernet Routing Switch 4800 Series, CFM is implemented using the LBM and LTM features only to debug SPBM.

For more information about CFM, see *Avaya Ethernet Routing Switch 4800 Series Configuration - SPBM* (NN47205-507).

IS-IS

To provide a loop-free network and to learn and distribute network information, Shortest Path Bridging MAC (SPBM) uses the Intermediate-System-to-Intermediate-System (IS-IS) link state routing protocol. IS-IS is designed to find the shortest path from any one destination to any other in a dynamic fashion. IS-IS creates any-to-any connectivity in a network in an optimized, loop-free manner, without the long convergence delay experienced with the Spanning Tree Protocol. IS-IS is a link-state, interior gateway protocol that was developed for the International Organization for Standardization (ISO). ISO terminology refers to routers as Intermediate Systems (IS), hence the name Intermediate System-to-Intermediate System (IS-IS).

Note:

The ERS4000 IS-IS implementation is used exclusively with the SPBM feature. IS-IS cannot be used over non-SPBM enabled interfaces.

Other changes

See the following section for information about changes that are not feature-related.

New Introduction chapter

The Introduction chapter replaces the Purpose of this document and Customer service chapters.

ACLI commands listed by mode

ACLI commands listed by mode, section is deleted from the document. For information about ACLI commands and modes, see *ACLI Commands Reference for Avaya Ethernet Routing Switch 4000 Series*, NN47205-105.

Chapter 3: Feature licensing fundamentals

About this task

This section provides information to help understand, install, and manage feature licensing. Review this section before using licensed features or before making changes to the license configuration.

Important:

If you reset a standalone device to the default configuration, you erase the license file.

Feature licenses

This section describes the types of licenses and lists the features that require a license. Software releases prior to Release 5.4 require no licenses. Switches and licenses are purchased separately. The Avaya Ethernet Routing Switch 4000 series supports trial and advanced license types.

To use the following features you must obtain the appropriate license:

- Open Shortest Path First (OSPF) (beginning with Release 5.4)
- Virtual Router Redundancy Protocol (VRRP) (beginning with Release 5.5)
- Equal Cost Multi Path (ECMP) (beginning with Release 5.6)

A trial license can be obtained to try out advanced license features for 30 days. Trial licenses are obtained from Avaya and installed using the ACLI. After the trial period has expired the licensed feature is disabled.

To minimize network and device impacts, the following events occur before the expiration of a trial license:

- A system trap is sent five days before license expiration.
- A system trap is sent one day before license expiration.
- A system trap is sent at license expiration.

To fully enable advanced license features, a license kit must be purchased, a license file generated, and the file installed on the switch. Each license kit contains a license certificate and a License Authorization Code (LAC) for a specific number or level of licenses. The license certificate contains the following instructions for license file generation:

- obtain the switch Base MAC address for license file generation
- go to www.avayadatalicensing.com, enter user information and select the required action. For example, select **Create/Generate a License file for your Avaya data product**.

Note:

An email address is mandatory so that the license file can be forwarded for installation on your Avaya switch.

- enter the License Authorization Code (LAC) to receive license entitlements and generate a license file
- install the license file on the switch

License generation

After purchasing a license kit, a license file must be generated using the Avaya data licensing portal. The licensing portal is where license files are generated or MAC addresses are swapped in existing license files.

The license certificate found in the license kit contains a License Authorization Code (LAC). This LAC is submitted to the license portal, which deposits license entitlements into a license bank. This license entitlement is combined with the switch MAC address to generate a license file. Because license files are generated based on a switch MAC address, the license file must contain the authorized MAC addresses of the switches where it will be installed.

A license can contain multiple MAC addresses and MAC addresses can be added to the license file at a later time. A single license file can support more than one MAC address. The number of MAC addresses supported is dependent on the type of license. To support licensed features in a stack, use the MAC address of the Base Unit.

The following table provides information on the license kits available for the Avaya Ethernet Routing Switch 4000:

Product Order Code	License Type	Number of switches / switch stacks supported
AL4516001	ERS4000 Adv License	1
AL4516002	ERS4000 Adv License	10

Generating a license file

About this task

This section contains the procedure for license file generation. Ensure the following prerequisites are met before generating a license:

- Purchase a license kit
- Ensure a properly configured TFTP server is reachable from the switch or stack on, which the license file will be installed.
- Obtain the switch base MAC addresses for the switches that use licensed features.

License file names must conform to the following limitations:

- 63 character maximum
- Lower case characters only
- No spaces or special characters permitted with the exception of the underscore (_)
- A three character file extension is required. This file extension can be any three characters.

To generate a license file for multiple MAC addresses, the addresses must be specified in a text file that conforms to the following rules:

- ASCII text file
- one MAC address per line
- no additional characters, spaces, or special characters besides those used in the MAC addresses
- MAC addresses in hexadecimal, capitalized format with each pair of characters separated by colons
- must contain correct MAC addresses
- the number of MAC addresses specified must not exceed the maximum for the license type

Use the following procedure to generate a license file.

Procedure

1. Use a web browser to access the licensing portal.
2. Enter the contact information in the required boxes. It is mandatory to enter an email address.
3. Select **Create/Generate a License file for your Avaya data product**.
4. Enter the License Authorization Code.

5. Enter switch or switch stack base MAC address(es). If the LAC is for 10 or more license entitlements, enter multiple MACs to be embedded in the license file.
6. Specify the License Bank name (optional).
7. Specify the License file name (optional). A license filename can be re-named before being installed on a switch.
8. Click **Submit Request**.

Installing a license file

About this task

This procedure is used to install a license file. If the switch is reset to default, the license file must be reinstalled and the switch reset to reenable licensed features. Resetting a switch to default removes the license file from its storage area in NVRAM.

Store the license file on a TFTP server accessible by the switch or stack before starting the installation procedure. For switches equipped with a USB port, you can also use a USB mass storage device to copy the license file to the switch.

Procedure

1. At the Privileged Executive command prompt, enter the command `copy [tftp|usb] license <tftp_ip_address> filename <license_file_name>`.
2. Restart the switch.

Result

License installation example using USB

1. Insert a USB mass storage device into a USB port on the front of the switch.
2. To copy a license from a USB mass storage device, use the following command: `copy usb license 4500_adv.lic`

   The switch generates the message: `License successfully downloaded`

   Note:

   You must reboot the system to activate the license.

Installing a license file using SFTP

Use this procedure to install a license file using SFTP.

Before you begin

- Store the license file on an SFTP server accessible by the switch or stack before starting the installation procedure.
- For authentication using an RSA or DSA key, the authentication key must be generated and uploaded to server.

Procedure

1. Enter Privileged EXEC mode in ACLI:
   `enable`
2. Use the following command to download and install the license file if you use an RSA or DSA key for authentication:
   `copy sftp license address <sftp_ip_address> filename <license_file_name> username <user_name>`
3. Use the following command to download and install the license file if you use a password for authentication:
   `copy sftp license address <sftp_ip_address> filename <license_file_name> username <user_name> password`
4. Restart the switch.

Variable Definitions

The following table describes the parameters for the `copy sftp license` command

Variable	Value
<sftp_ip_address>	Specifies the address of the SFTP server.
<license_file_name>	Specifies the license filename.
<user_name>	Specifies the username.

Displaying licenses

About this task

Display an installed license file using the command `show license {<1-10> | all} [verbose]`. Specify an individual license with the designated number or use the `all` keyword to display all installed licenses.

Deleting a license

About this task

Delete an installed license file using the command `clear license { <1-10> | all}` in Privileged Exec mode. Specify an individual license with the designated number or use the `all` keyword to delete all installed licenses.

License transfer

About this task

The Avaya Ethernet Routing Switch 4000 implements Licensing Auto Unit Replacement. If a base unit fails, the other units in the stack will transfer a virtual key to the new base unit to eliminate the need for transfer of a license to the new base unit. Even with this functionality in place, there are still several situations where it becomes necessary to transfer the license from one device to another. These conditions are as follows:

- replacement of failed non base unit
- incorrect MAC address entered during license file generation
- the system displays an error message indicating the limit of MAC swaps for the license has been exceeded

Use the following procedure to transfer a license.

Procedure

1. Use a web browser to access the licensing portal.
2. Enter the contact information in the required boxes. It is mandatory to enter an email address.
3. Select **Replace or Swap a MAC address in an existing license file**.
4. Enter the License Authorization Code.

5. Enter switch or switch stack base MAC address(es). If replacing a license file that had multiple MACs, re-enter the MACs including the new MAC.
6. Specify the License Bank name (optional).
7. Specify the License file name (optional). A license filename can be re-named before being installed on a switch.
8. Click **Submit Request**.

   If you exceed the MAC replacement threshold, a message appears confirming that the MAC swap is unsuccessful. Select a different LAC entry and try again. If no other LAC entries appear in the list, contact technical support.
9. After the system displays MAC swap successful, click **Return to License Bank Details**.
10. Select the transaction that contains the license file name with the new MAC address.
11. Click **Download**.

Special cases with software licensing

About this task

The following sections describe situations when software licensing can be lost or fail.

Downgrade of switch software followed by upgrade of switch software

On a standalone switch, if you downgrade from R5.4 or later software to R5.3 or earlier software, and then upgrade back to R5.4 or later software, the software license is lost.

In a stack, if you downgrade from R5.4 or later software to R5.3 or earlier software, and then upgrade back to R5.4 or later software, the license is retained. The system sets the operational license to Advanced software and the installed license displays as none. Because R5.3 is unaware of software licensing, the license can be lost in the rare event that memory is reused. If this happens, you must reinstall the software license after upgrade.

Base unit failure in a stack of 2 units

It is not recommended to operate a stack of two switches with a software license based only on the base unit (BU) MAC address. If the base unit fails, after you reboot the former non-base unit (NBU), now a standalone switch, the switch is unlicensed.

To prevent the loss of the software license, Avaya recommends that you install a software license that contains the NBU MAC address.

Base unit failure in a stack of more than 2 units

It is not recommended to install a license file when the system is operating in temporary base unit (TBU) mode.

In a stack, if you create a license file based on the MAC address of the base unit (BU), then designate another unit in the stack as the BU, when you download the license file the system generates error messages and the license process fails.

Chapter 4: User interface fundamentals

This chapter provides basic information to help you understand the interfaces you can use to configure and manage an Avaya Ethernet Routing Switch. Available features depend on switch model and configuration.

ACLI concepts

Avaya Command Line Interface (ACLI) is a text-based interface that you can use for switch configuration and management. A common command line interface (CLI), ACLI follows the industry standard used for device management across Avaya products.

The command modes within ACLI are listed in order of increasing privileges and each mode is based on user logon permission level. User logon permission is determined by logon password as supplied by your system administrator.

You can access ACLI directly through a console connection, remotely through a dial-up modem connection, or in-band through a Telnet session.

You can use ACLI interactively or use `configure network` to load and execute ACLI scripts, manually loading the script in the console menu or automatically loading the script at startup. For more information about the command, see Downloading Configuration file using ACLI.

The following topics describe ACLI command modes, provide procedures to access ACLI, and describe ACLI help.

- ACLI command modes
- ACLI access procedures
- ACLI help

ACLI command modes

ACLI provides the following command modes:

- User EXEC
- Privileged EXEC
- Global Configuration
- Interface Configuration

- Router Configuration
- Application Configuration

Mode access is determined by access permission levels and password protection.

If no password is set, you can enter ACLI in User EXEC mode and use the **enable** command to move to the next level (Privileged EXEC mode). However, if you have read-only access, you cannot progress beyond User EXEC mode, the default mode. If you have read-write access you can progress from the default mode through all of the available modes.

With sufficient permission, you can use the rules in the following table to move between the command modes.

Table 1: ACLI command modes

Command mode and sample prompt	Entrance commands	Exit commands

User EXEC
`4548GT-PWR>`
	No entrance command, default mode	`exit`
		or
		`logout`

Privileged EXEC
`4548GT-PWR#`
	`enable`	`exit`
		or
		`logout`

Global Configuration
`4548GT-PWR(config)#`
	`configure terminal`	mode, enter:
		`end`
		or
		`exit`
		To exit ACLI completely, enter:
		`logout`

Interface Configuration
`4548GT-PWR(config-if)#`
You can configure the following interfaces:
• Ethernet
• VLAN
	From Global Configuration mode: To configure a port, enter: `interface ethernet <port number>`
	To configure a VLAN, enter: `interface vlan <vlan number>`
		To return to Global Configuration mode, enter:
		`Exit`
		To return to Privileged EXEC mode, enter:
		`end`
		To exit ACLI completely, enter:
		`logout`

Router Configuration `4548GT-(configrouter)#` You can configure the following routers: • RIP • OSPF	From Global or Interface Configuration mode: To configure RIP, enter `router rip`. To configure OSPF, enter `router ospf`. To configure VRRP, enter `router vrrp`. To	To return to Global Configuration mode, enter `exit`. To return to Privileged EXEC mode, enter `end`. To exit ACLI completely, enter `logout`.

Command mode and sample prompt	Entrance commands	Exit commands
• VRRP • ISIS	configure IS-IS, enter `router isis`.	
Application Configuration `4850GT-(config-app)`	From Global, Interface or Router Configuration mode, enter `application`.	To return to Global Configuration mode, enter `exit`. To return to Privileged EXEC mode, enter `end`. To exit ACLI completely, enter `logout`.

ACLI access procedures

About this task

Perform the procedures in this section to access ACLI.

Prerequisites

- Connect to the switch with a console cable, connected directly to the console port, or use Telnet.
- To connect to the switch remotely, through Telnet, ensure that you enable remote access and that the switch IP address is valid.
- Use a terminal or PC, with a terminal emulator, as the ACLI command station.
- If you use a console cable and console port, ensure that the terminal emulation program conforms to settings listed in the following table.

Property	Value
Baud Rate	9600 bps
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None
Terminal Protocol	VT100 and VT100/ANSI

Opening an ACLI session

Procedure

1. Connect to the switch.

2. Enter the password, if applicable.
3. At the ACLI Banner Screen, enter `CTRL+Y`.
4. To access ACLI, from the main menu, press `c` or scroll to `Command Line Interface`.
5. Press `Enter`.

ACLI help

This section describes help available in ACLI.

ACLI help is available at all levels.

ACLI list

From the Privileged EXEC mode, the ACLI list command, `show cli list` displays a detailed view of the ACLI commands. Additionally, the verbose command, `cli list verbose` lists the CLI syntax for each command.

Command list

To obtain a list of all commands available from a prompt, enter a question mark (`?`).

Command options

To obtain a list of all options for a command, at the prompt enter a portion of a command followed by a space and a question mark (`?`).

Command names

To obtain a correct command name, at the prompt enter a portion of the command name, and then press the Tab key. The system displays the first unambiguous match for your selection. For example, enter `down + Tab` and the system displays `download`.

Command modes

To obtain a list of ACLI command modes available, enter `help modes`.

Commands organized by mode

To obtain a list of ACLI commands, organized by command mode, enter `help commands`. A short explanation of each command is included.

Keystroke shortcuts

To make using ACLI easier, use the keystroke shortcuts in the following table.

Key combination	Function
`Ctrl+A`	Start of line

Key combination	Function
`Ctrl+B`	Back 1 character
`Ctrl+C`	Abort command
`Ctrl+D`	Delete the character indicated by the cursor
`Ctrl+E`	End of line
`Ctrl+F`	Forward 1 character
`Ctrl+H`	Delete character left of cursor (Backspace key)
`Tab`	Command or parameter completion
`Ctrl+K` and `Ctrl+R`	Redisplay line
`Ctrl+N` or `Down arrow`	Next history command
`Ctrl+P` or `Up arrow`	Previous history command
`Ctrl+T`	Transpose characters
`Ctrl+U`	Delete entire line
`Ctrl+W`	Delete word to left of cursor
`Ctrl+X`	Delete all characters to left of cursor
`Ctrl+z`	Exit Global Configuration mode to Privileged EXEC mode
`?`	Context sensitive help
`Esc+C` and `Exc+U`	Capitalize character at cursor
`Esc+l`	Change character at cursor to lower case
`Esc+B`	Move back 1 word
`Esc+D`	Delete 1 word to the right
`Esc+F`	Move 1 word forward

Enterprise Device Manager concepts

This section provides information to start and use Enterprise Device Manager (EDM) to monitor, manage, and configure Avaya Ethernet Routing Switch 4000 Series switches.

If you want to manage the switch from a centralized location, using Configuration and Orchestration Manager (COM) 2.0 and higher, Avaya offers optional, product-specific EDM plug-ins for COM that include other features such as centralized syslog, trap viewer, troubleshooting and diagnostic tools. For more information, or to purchase plug-ins, go to www.avaya.com.

The following table compares EDM functions in the embedded version to COM plug-in version.

Table 2: EDM functions: embedded version compared to COM plug-in version

EDM functions	Embedded version	Plug-in version
100% device configuration: device view, device-specific configuration	Yes	Yes
Stackable Device Web User Interface features	Yes	No
Centralized off-box multi-user element management: • user and device credential manager • user preference • SSO-based user access control • user-based Device Access Control (read only and read-write) • authentication through third party (RADIUS, Microsoft AD, Sun AM)	No	Yes
Centralized EM plug-in management (downloadable install and uninstall, upgrade, patch, and inventory view	No	Yes
User activity log and audit trail	No	Yes
Device performance monitoring and polling	Limited	High performance and low latency
Device-specific single device wizards and template	No	Yes
Centralized syslog and trap viewer	No	Yes
Troubleshooting and diagnostic tools (ping, CLI*Manager, path-trace)	No	Yes

EDM is an embedded application that you can use for single device element management and configuration through a standard Web browser. Because EDM is embedded into Ethernet Routing Switch software, and the switch operates as a Web server, you do not require additional client software.

Supported Web browsers

The following is a list of Internet Web browsers supported by EDM:

- Microsoft Internet Explorer versions 7.0 and 8.0
- Mozilla Firefox version 3.x

Memory requirements

If you install Configuration and Orchestration Manager on a PC to manage your switch, the PC must have at least 500 MB of free disk space.

There are no memory requirements to use EDM through a Web browser.

Online help

Online help is context-sensitive and appears in a separate window in the Web browser.

To obtain help for the current topic, click the help button on the toolbar in the work area.

If you are using EDM through a Web browser, you need to download the help file to a TFTP server or a USB mass storage device and configure the EDM Help file path. For procedures, go to Getting EDM online help files for embedded EDM on page 54.

Interface components

This section describes Enterprise Device Manager interface components.

The Enterprise Device Manager window includes the following parts:

- Navigation tree toolbar
- Switch Summary View
- Device Physical View
- EDM window
- Navigation tree
- Menu bar
- Tool bar
- Work area

Switch summary view

The EDM initial view displays a switch summary view in the work area.

The Switch Summary tab displays basic switch information. This information-only display derives from the configuration tab **Edit** > **Chassis** > **Chassis**.

Following is a list of the fields on the **Switch Summary** tab:

- hardware model
- hardware version
- firmware version
- software version
- system up time
- system object identifier
- system contact
- system name
- system location

A Stack Information panel appears at the bottom of the switch summary view work area that provides a description of your switch or the units in your switch stack.

This information includes the following:

- Unit number (for stacks) — also lists which unit is the base unit in a stack Switch type
- Description
- Running software version

Device Physical View

Device physical view
When you access EDM, the first panel in the work area displays a switch summary view. The tab behind the summary view is a real-time physical view of the front panel of the device or stack called the Device Physical View.

Objects in the Device Physical View are:

- a stand-alone switch, called a unit
- a switch stack, called a chassis
- a port

From the Device Physical View, you can

- determine the hardware operating status
- select a switch or a port to perform management tasks on specific objects or view fault, configuration, and performance information for specific objects

Click to select an object. The system outlines the object in yellow, indicating that the object is selected.

The conventions on the device view are similar to the actual switch appearance except that LEDs in Device Physical View do not blink. The LEDs and the ports are color-coded to reflect hardware status. Green indicates the port is up and running; red indicates that the port is disabled.

From the menu bar, you can click the **Device Physical View** tab to open the Device Physical View any time during a session.

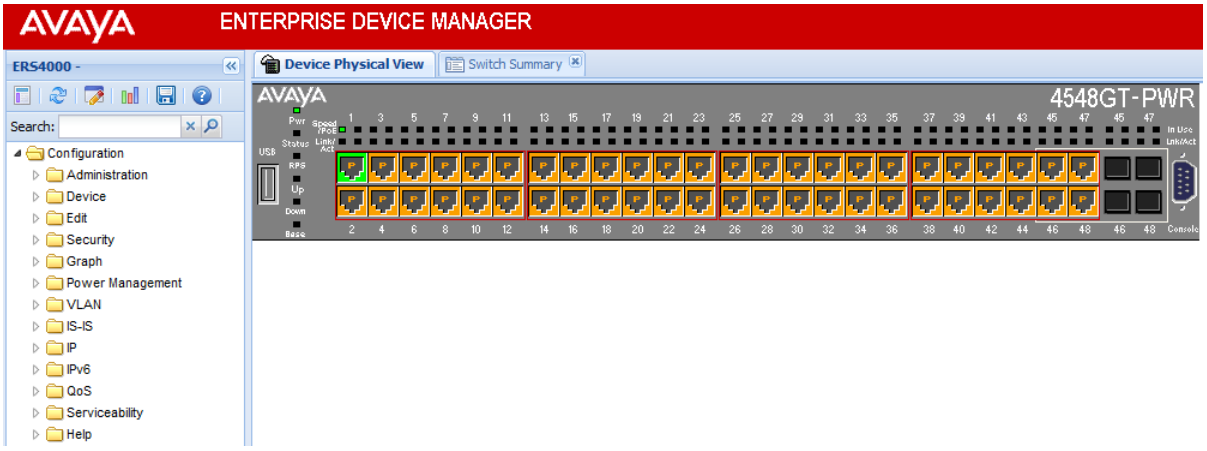


Figure 1: Device Physical View

EDM window

The EDM window contains the following parts:

1. navigation tree—the navigation pane on the left side of the window that displays available command folders in a tree format
2. navigation tree toolbar—the area displays buttons for common functions
3. menu bar—the area at the top of the window that displays primary and secondary tabs that you accessed during the session; the tabs remain available until you close them
4. toolbar—the area just below the menu bar that provides quick access to the most common operational commands such as **Apply**, **Refresh**, and **Help**

5. work area—the main area on the right side of the window that displays the dialog boxes where you view or configure switch parameters
6. Auto Complete Search — the area between the navigation tree toolbar and the navigation tree where you can type a partial or complete search string to find menus. When you type the search string, the navigation tree changes to display only the entries associated with your search. To return to the full navigation tree display, click the x beside the Auto Complete Search dialog box.

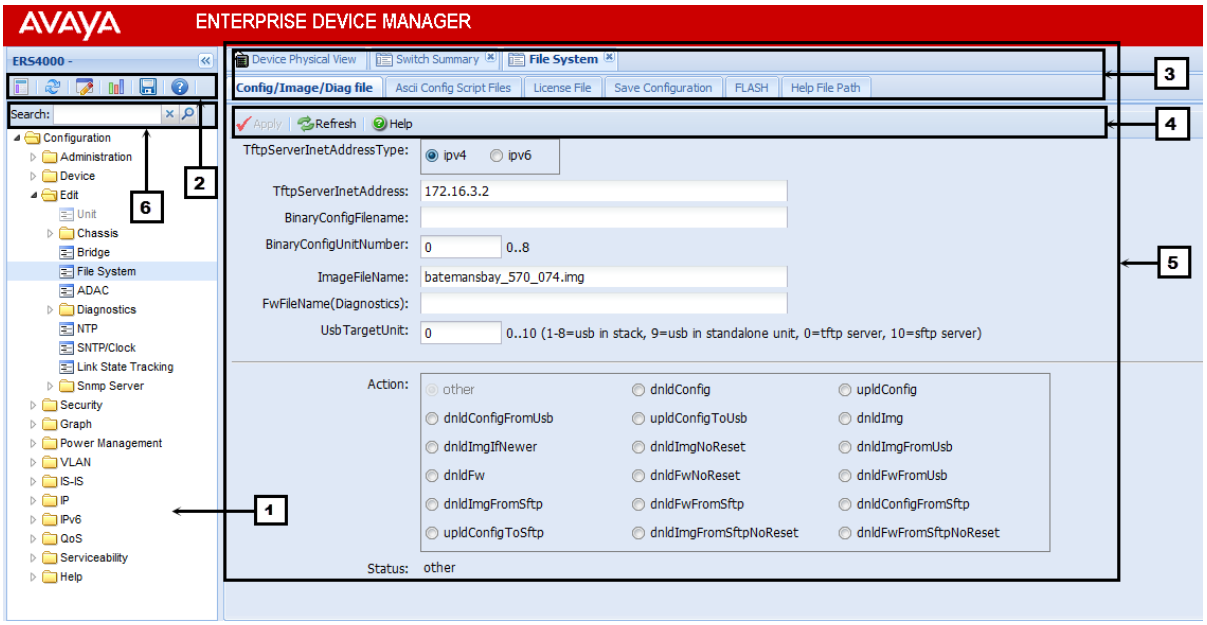


Figure 2: EDM window

Navigation tree

The navigation tree displays available command topics as folders in a tree.

To open a folder or sub-folder, you can click the arrowhead to the left of the folder or double-click the folder to display the available commands tabs.

To close a folder, click the arrowhead once.

To access a command tab, click the selection in the navigation tree.

Navigation tree toolbar

You can use the toolbar above the navigation tree to perform common functions more easily.

Figure 3: Toolbar

The following is a description of the toolbar button functions:

Button	Description
	Switch Summary — you can use the **Switch Summary** toolbar button to open or reopen the switch summary tab.
	Refresh Status — in addition to the existing refresh methods you can use the **Refresh Status** toolbar button to refresh the device status
	Edit Selected — in addition to the existing edit methods, and depending on which object you select on the Device Physical View, you can use this toolbar button to open **Edit > Chassis**, **Edit > Unit**, or **Edit > Ports** tabs. If you do not select an object from the Device Physical View and you click the **Edit Select** toolbar button, the **Edit > Chassis** tab opens.
	Graph Selected — depending on which object you select on the Device Physical View, you can use this toolbar button to open **Graph > Chassis** or **Graph > Port** tabs. If you do not make a selection on the Device Physical View, or if you select Unit, the **Graph > Chassis** tab opens.
	Save Config — you can use the **Save Config** toolbar button to save the configuration to flash memory.
	Help Setup Guide — this button connects you to the help setup guide for embedded EDM and it replaces the link that appeared on the top right of work panes.

Menu bar

The menu bar appears above the work area and consists of two rows of tabs.

The top row displays tabs that were accessed from the navigation tree during the active session. The tabs in this row, called primary tabs, are docked and available to reopen on demand. The docked tabs appear in the sequence that you accessed them.

When you click a primary tab from the menu bar, the associated secondary tabs appear in the second row and the default dialog box appears in the work area. Click any secondary tab to display its associated dialog box.

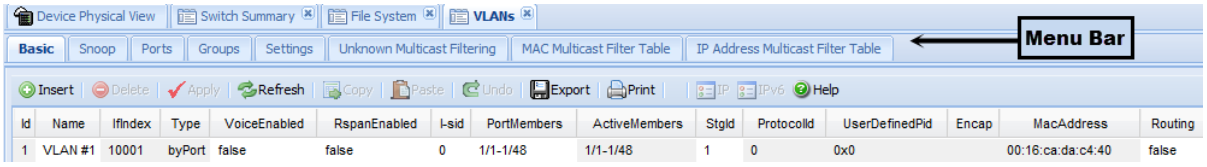


Figure 4: Menu bar

If you want to open a dialog without displacing the current open dialog, you can go to the tab on the menu bar and undock the tab by using your mouse to drag and drop it into the work area. You can drag the dialog box to any location on the screen and you can toggle between the open dialog boxes to compare information and make changes. When you no longer need the undocked tab, you can use the three buttons on the upper right side of the tab to temporarily shrink it, re-dock it, or close it.

Important:

When you undock a tab to make changes, and then return to another open tab, in order to see the effects of the changes you must click the **Refresh** button on the tool bar.

In both rows of the menu bar, arrows can appear on the left and right sides when the number of open tabs exceeds the available space. You can use the arrows to scroll to a tab, or you can select the tab from the navigation tree.

To reduce the number of open tabs, click the **X** button on the top right of a tab to close it.

Tool bar

The tool bar, located below the menu bar, contains buttons that provide quick access to commonly used operational commands. Depending on the tab selected, different buttons can appear.

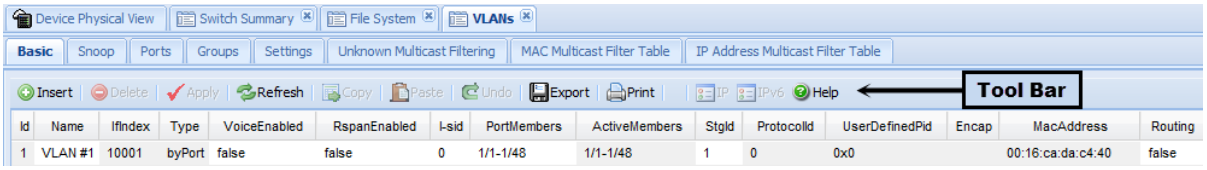


Figure 5: Tool bar

The following table describes common tool bar buttons.

Table 3: Common tool bar buttons

Button	Name	Description
	Apply	Executes parameter changes.
	Refresh	Refreshes screen data.
	Help	Displays context-sensitive online help for the current dialog box.
	Insert	Opens an insert dialog box. Submits the entry from the insert dialog box. The insert buttons appear only on panes where you can insert entries.
	Delete	Removes a selected entry.

Work area

The work area, on the right side of the EDM page, displays the switch Device Physical View and dialog boxes related to the menu selections in the navigation tree. You can use the work area to view and configure switch parameters from the dialog boxes that appear in the work area.

See the following figure for an example of the work area for the **Edit** > **File System** > **Config/Image/Diag file** dialog.

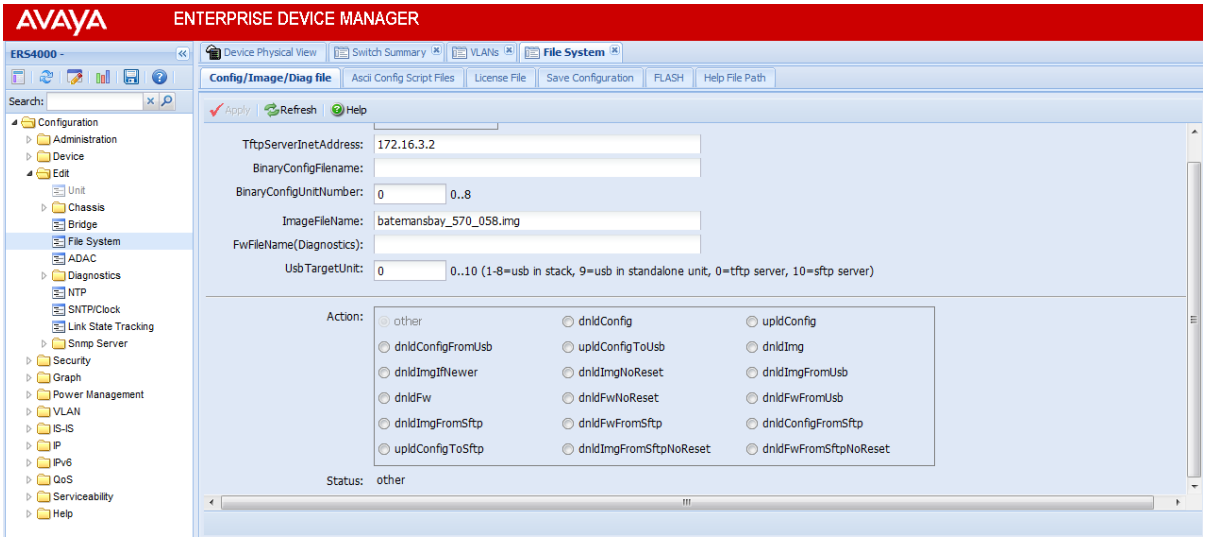


Figure 6: EDM work area

Single port configuration for EDM

You can apply configuration changes to single ports by using one of the following methods:

- From the Device Physical View, right-click a port and select **Edit** from the drop-down menu, and then click the appropriate tab.

  The following figure displays the drop-down menu for the selected port in the Device Physical View.

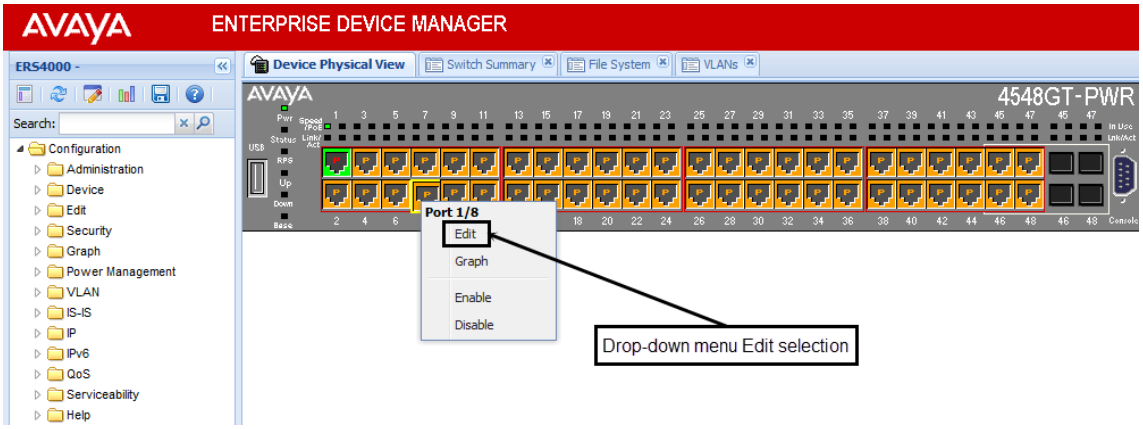


Figure 7: Device Physical View - port edit

The following figure displays the port edit work area with the **VLAN** tab selected.

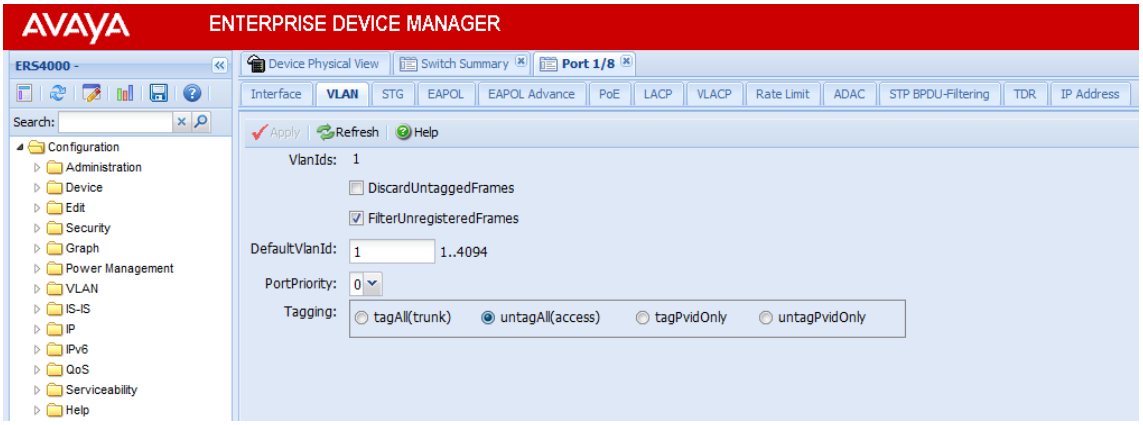


Figure 8: Port edit -VLAN tab

- From the Device Physical View, click a port, and then from the Navigation tree select any tab from the **Edit** > **Chassis** > **Ports** work flow, and modify editable parameters.

  The following figure displays the **Edit** > **Chassis** > **Ports** work area with the **Interface** tab selected.

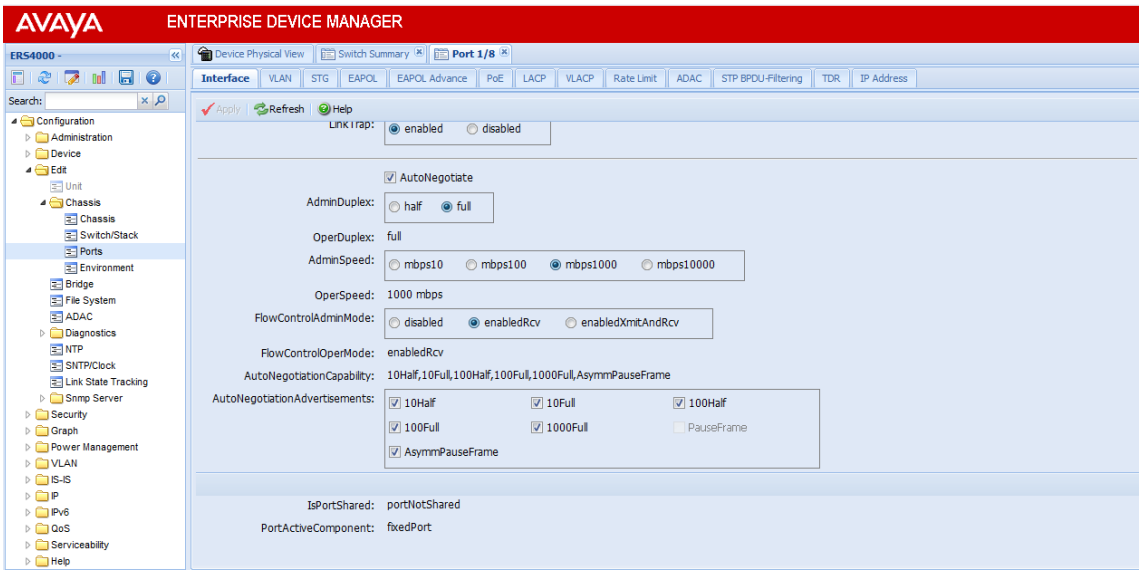


Figure 9: Edit, Chassis, Ports - Interface tab

- From the Navigation tree select a port-related tab from a specific, applicable feature work area (for example, VLAN, VLANs, Ports), and double-click a cell under an editable parameter column heading in the appropriate port row of the table.

  The following figure displays the **VLAN** > **VLANs** > **Ports** tab work area.

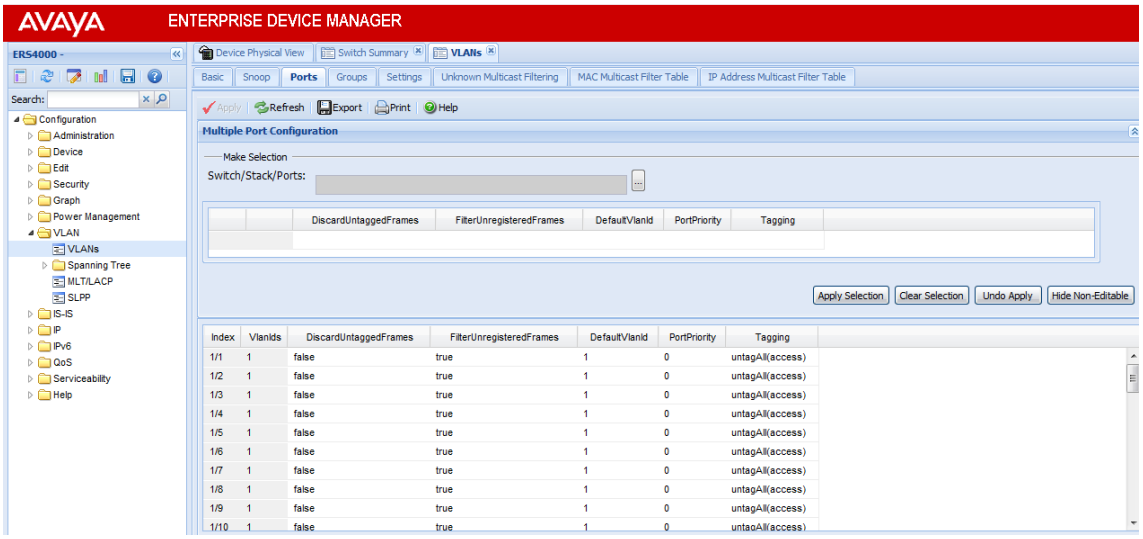


Figure 10: VLAN, VLANs - Ports tab

Multiple Port Configuration for EDM

When you need to apply the same configuration changes to more than one port, you can use the Multiple Port Configuration function in any the following ways:

- In the **Device Physical View**, hold down the **Ctrl** key and click the ports. Then select the appropriate tab in the **Edit** > **Chassis** > **Ports** work area to configure the ports.
- In the **Device Physical View**, hold down the **Ctrl** key and click the ports you want to configure. Then right-click and select **Edit** from the menu.
- In the **Device Physical View** click and drag to surround a group of related ports. Then select the appropriate tab in the **Edit** > **Chassis** > **Ports** work area to configure the ports.
- In the **Device Physical View**, click and drag to surround a group of related ports. Then right-click and select **Edit** from the menu.

The system can generate error messages if you apply a change to all ports when some ports in the list do not support the change. The error messages provide only the error information and do not list individual ports.

The following sections use the **Edit** > **Chassis** > **Ports** > **Interface** tab work area to describe the available Multiple Port Configuration functions.

In the work area for any of the **Edit** > **Chassis** > **Ports** tabs, the following two panes appear in the default view:

- Multiple Port Configuration pane—provides port selection for one port, several ports, or all ports, and configurable port parameters
- Tab work pane—displays existing configuration information for the feature and configurable cells for individual ports

With Multiple Port Configuration you can perform the following:

- Hide non-editable fields from the multiple configuration pane so that you choose to view only those fields that can be configured.
- Select an individual port or a group of ports from the Port Editor.
- Select all ports from the Port Editor, if you are on a feature tab. If you used **Edit** > **Chassis** > **Ports** you already selected the ports on the Device Physical View.
- Double-click any or all of the editable fields to change the configuration parameter.
- Clear your selections.
- Apply your selections.
- Undo the application of your selections.

You can expand or collapse the Multiple Port Configuration pane by clicking the Multiple Port Configuration task bar. The Multiple Port Configuration pane is expanded by default.

The following figure displays the tabs available in the **Edit** > **Chassis** > **Ports** work flow, with the **Interface** tab selected and the **Multiple Port Configuration** pane expanded.

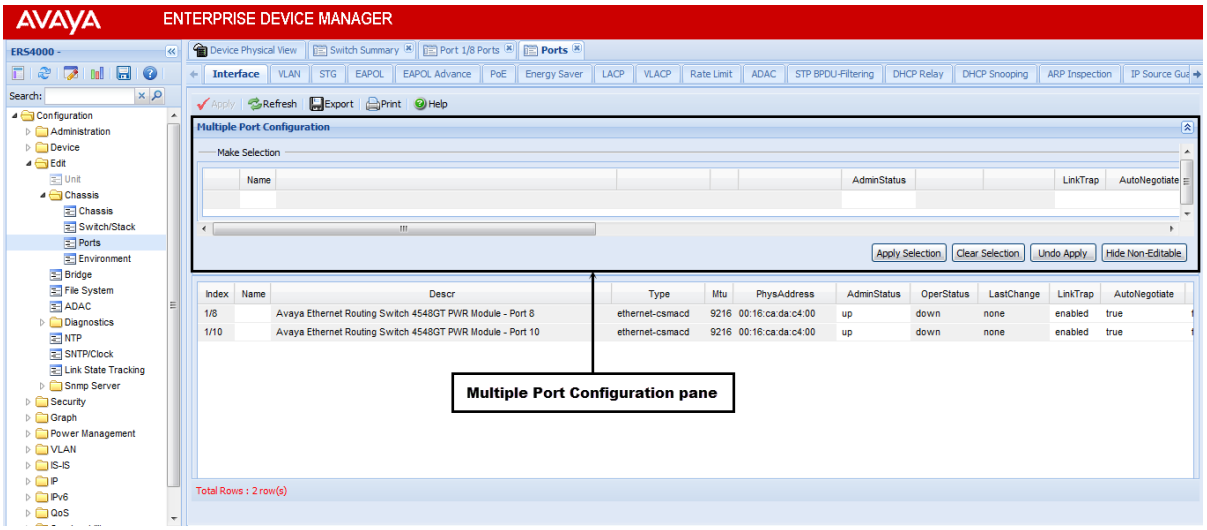


Figure 11: Interface tab - Multiple Port Configuration pane expanded

The following figure displays the **Edit** > **Chassis** > **Ports** > **Interface** tab with the **Multiple Port Configuration** pane collapsed.

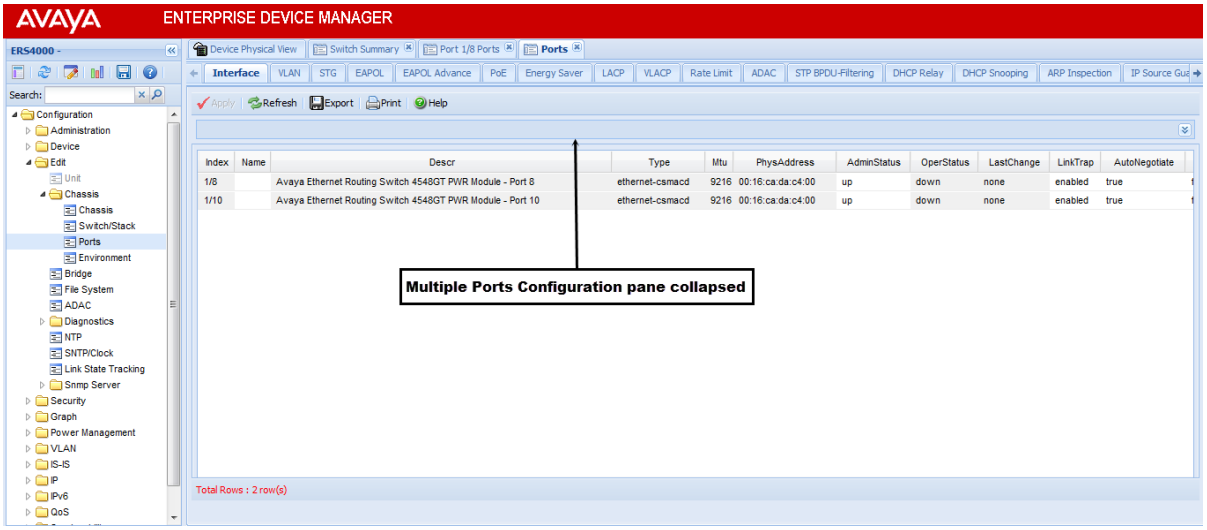


Figure 12: Interface tab - Multiple Port Configuration pane collapsed

Changes you make to a port configuration using Multiple Port Configuration are applied to the switch configuration only after you click **Apply** on the work area toolbar.

The following figure displays the location of the **Apply** button on the work area toolbar.

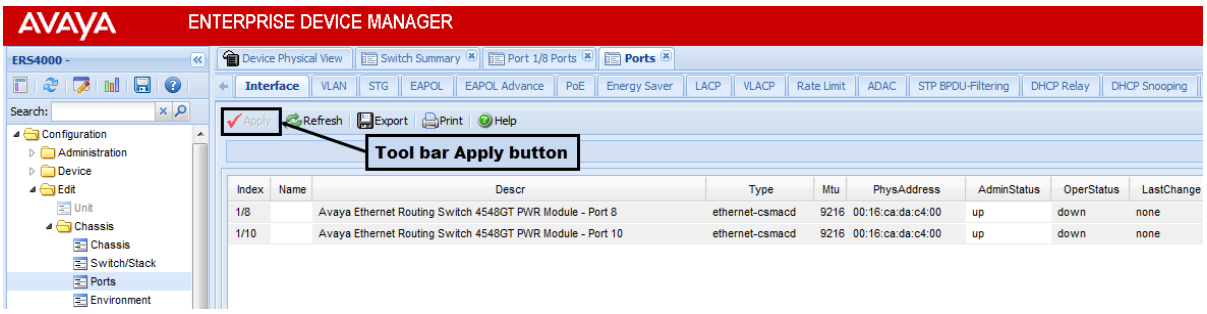


Figure 13: Toolbar Apply button

Enterprise Device Manager procedures

About this task

This section contains procedures for starting and using Enterprise Device Manager (EDM) on your switch. You can use EDM software on the switch; there is no need to install any client-based application on your PC.

Configuring EDM through ACLI

This section describes how to enable and configure the Enterprise Device Manager (EDM) using ACLI.

Enabling the Web server using ACLI

About this task

The Web server is enabled by default. If you have assigned an IP address to the switch, you can access EDM.

If you have disabled the Web server you can use the following procedure to enable and manage the Web server using ACLI. After you enable the Web server, you can start EDM. For more information about the Web server, see *Configuring Security on Avaya Ethernet Routing Switch 4000 Series*, NN47205-505.

Prerequisites

- Open an ACLI session
- Access Global Configuration mode

Procedure

To enable the Web server, enter the following command:

```
web-server enable
```

Disabling the Web server using ACLI

About this task

Use the following procedure to disable the Web server using ACLI. After you disable the Web server, you cannot start EDM.

Prerequisites

- Open an ACLI session
- Access Global Configuration mode

Procedure

To disable the Web server, enter the following command:

```
no web-server enable
```

Displaying the Web server status using ACLI

About this task

Use the following procedure to display the Web server status using ACLI.

Prerequisites

- Open an ACLI session
- Access Global Configuration mode

Procedure

To display the Web server status, enter the following command:

```
show web-server
```

Variable Definitions

Variable	Value
disable	Disables HTTP access.
enable	Enables HTTP access.
show	Shows Web server status.

Starting EDM

To configure and maintain your switch through a Web-based graphical user interface, use the following procedure to start EDM.

Before you begin

- Ensure that the switch is running.
- Note the switch IP address.
- Ensure that the Web server is enabled.
- Note the user name.
- Note the password.
- Open one of the supported Web browsers.

About this task

Follow these steps to open an EDM session on your switch.

Procedure

1. In a supported Web browser, enter the IP address of the switch using one of the following formats:
   - `http://<IP Address>`
   - `https://<IP Address>`
2. Enter the user name.
3. Enter the password.
4. Click **Log On**.

Using shortcut menus

About this task

In the EDM Device Physical View you can use shortcut menus to edit objects and apply changes.

Procedure

1. In the Device Physical View, select an object.
2. Right-click the object.
3. Select a function from the list.

Variable Definitions

Field	Description
Unit	
Edit	Displays the Edit unit dialog box and tabs.
Refresh Status	Refreshes switch status.
Refresh PoE Status	Refreshes the PoE status only to units equipped with Power over Ethernet.
Refresh Port Tooltips	Refreshes the port tooltip data. Port tooltip data contains: Slot/Port, PortName, and PortOperSpeed.
Identify Unit	Identifies the switch units.

Field	Description
Port	
Edit	Displays the Edit port dialog box and tabs.
Graph	Displays the graph port dialog box and tabs.
Enable	Enables the port administratively.
Disable	Shuts down the port administratively.

Opening folders and tabs

The following section describes how to navigate around Enterprise Device Manager (EDM) and open folders and tabs.

Navigating around EDM

About this task

Use the following procedure to navigate around EDM.

Procedure

1. In the navigation pane, click the arrowhead located to the left of a folder to display the sub-level folders in the tree.
2. If there is a sub-folder, double-click the folder or click the arrowhead to open the sub-folder.
3. The primary tabs appear under the folders and sub-folders. Click a tab to open it in the work area.

Undocking tabs

About this task

To improve certain types of configuration, you can view more than one tab at a time. To view more than one tab, you use the undock function to activate a previously-opened tab from the menu bar.

Important:

When you undock a tab to make changes, then return to another open tab, in order to see the effects of the changes you must click the **Refresh** button on the tool bar.

Procedure

1. From the menu bar, drag and drop the tab you want to open.
2. To reposition the tab in the work area, click and drag the title bar of the tab.

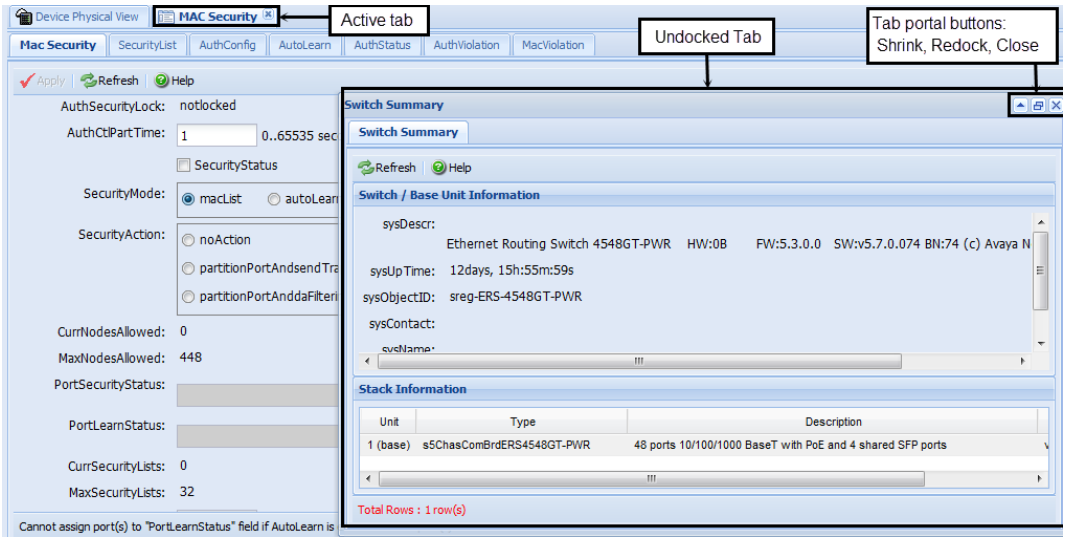


Figure 14: Undocking and docking tabs

Docking tabs

About this task

You can re-dock an undocked tab using either of the following methods.

Procedure

To re-dock a tab, do one of the following:

- On the undocked tab, click the dock-back button (the middle button on the top right of the panel).
- On the undocked tab, click the collapse button (left button on the top right of the panel) to temporarily minimize the panel.

Using dialog boxes

Many EDM dialog boxes contain editable fields where you can enter parameter values.

Some of those parameters have predetermined values. For example, you can enable or disable a port.

Other parameter values are ranges of values or user-determined values. For example, the value for the Location on the **Base Unit Info** tab is a location name you can choose and enter.

Editable fields in EDM dialog boxes appear in white.

EDM dialog box buttons

The following table describes buttons that appear in the EDM dialog boxes and tabs. Not all buttons appear in all dialog boxes.

Table 4: EDM dialog box buttons

Button	Description
Apply	Apply the changes you entered in fields on a tab or dialog box. The button is unavailable until you change a parameter.
Insert	Open a dialog box to create a new entry for a table; then, from the dialog box, insert the new entry in the table.
Delete	Delete a selected entry.
Refresh	Refresh the information in the window. Every time you click Refresh, the switch pools the system and displays new information.
Close	Close the tab or dialog box and disregard changes you made to fields.
Help	Open context-sensitive Online Help.
Stop	Stop the current action.
Copy	Copy selected items to your computer memory clipboard.
Paste	Paste the contents of your computer clipboard.
Undo	Undo last action.
Export	Copy data to external media.
Print	Print the contents of any displayed table.
Graph	Graph selected data.
Export (on Graph dialog boxes)	Save the current table in ASCII format in a file you specify. The table contains tabs that you can use to import this file into a text editor or spreadsheet for further analysis.
Clear Counters	Clear the existing number of counters and restart the counters.
Clear all	Clear the numbers of all statistics and restart the count.

Editing a dialog box

About this task

Use the following procedure to edit a dialog box.

Procedure

1. In the work area, double-click the field you want to edit.
2. Select a value from the list of predetermined values or enter the value for a field without preset values.

   Important:

   Enter an IP address in decimal format: <xxx>.<xxx>.<xxx>.<xxx>.

   Enter a MAC address in hexadecimal format: xx:xx:xx:xx:xx:xx.

   Time is a value based on the delta from the switch boot-up time.
3. Click **Apply**.

Inserting an entry in a dialog box

About this task

Use the following procedure to insert an entry in a dialog box.

Procedure

1. On the tool bar, click **Insert** .
2. Enter changes in the Insert dialog box.
3. Click **Insert** to submit the entry and return to the active tab in the work area.
4. On the toolbar, click **Apply** to commit the change to the configuration. The system refreshes the view and errors display in a browser popup.

Deleting an entry from a dialog box

About this task

Use the following procedure to delete an entry from a dialog box.

Procedure

1. Highlight the entry.
2. Click **Delete**.

Editing objects

You can edit objects in the Device Physical View from the navigation tree or the shortcut menu. Changes are not applied to the running configuration until you click **Apply**.

Editing an object using the shortcut menu

About this task

Use the following procedure to edit an object using the shortcut menu.

Procedure

1. On the Device Physical View, you can
   - right click an object
   - press Ctrl+click to select several objects; then right click
   - click and drag to select a group of objects; then right click
   - click an entire device; then right click
2. From the list, click **Edit**.
3. Edit the applicable tab in the work area.
4. Click **Apply**.

Editing file system elements

About this task

Use the procedure and job aid in this section to edit file system elements.

Procedure

1. Click the **Edit** arrowhead to open the Edit menu.
2. Click **File System** to open the File System tab in the work area. For further information about configuration files and licensing, see *Configuration files*

fundamentals and *Feature licensing fundamentals* in *Using ACLI and EDM on Avaya Ethernet Routing Switch 4000 Series*, NN47205-102.

Job aid, tabs in the File System work area

Tab	Description
Config/Image/Diag file	Use this tab to view information about and acquire image, configuration, and firmware files.
Ascii Config File	Use this tab to acquire ASCII configuration files.
License File	Use this tab to view and manage software licensing.
Save Configuration	Use this tab to save the current configuration manually or automatically.
FLASH	Use this tab to view the current number of erase or writes on a unit or stack.
Help File Path	Use this tab to designate the file path to the EDM help files. You can use a USB mass storage device or a TFTP server.

Job aid, folders and subfolders in the navigation tree

Folder	Description
Administration	Use the tabs associated with the sub-folders in the Administration folder to perform the following functions: • Quick Start –set up IP/Community/Vlan and Trap Receiver • Remote Access – enable or disable Telnet, SNMP, Web Page, and SSH • Run Script: configures parameters for the Ethernet Routing Switch 4000 series, according to Avaya best practices. Run Scripts are available for IP Office, LLDP, and ADAC. • MIB Web Page – perform MIB Walk
Device	Rediscover Device— Use the Rediscover Device selection to refresh the session. Caution: all existing tabs are lost.
Edit	Use the tabs associated with the sub-folders in the Edit folder to view or change

Folder	Description
	parameters for the currently-selected object. Sub-folders in the Edit folder are: • Unit • Chassis: Chassis, Switch/Stack, Ports, and Environment • Bridge • File System • ADAC • Diagnostics: Port Mirrors, L2Ping/L2 Trace Route, CFM, Topology, System Log. 802.1AB: LLDP, Port dot1, Port dot3, Port MED, Avaya • NTP • SNTP/Clock • Link State Tracking • Snmp Server: MIB View, User, Community, Host, Notification Control
Security	Use the tabs associated with the sub-folders in the Security folder to view or change security settings. Sub-folders in the Security folder are: • General • MAC Security • DHCP Snooping • Dynamic ARP Inspection (DAI) • IP Source Guard (IPSG) • 802.1X/EAP • Web/Telnet/Console • SSH/SSL • RADIUS • TACACS+
Graph	Use the tabs associated with the sub-folders in the Graph folder to view statistics and produce graphs of the statistics. Sub-folders in the Graph folder are:

Folder	Description
	• Chassis • Port —to view or graph statistics for a port, first select a port on the Device Physical View.
Power Management	Use the tabs associated with the sub-folders in the Power Management folder to view and configure Power over Ethernet (PoE) settings and to view and configure Energy Saver settings. Sub-folders in the Power Management folder are: • PoE • Energy Saver PoE is only available for switches equipped with Power over Ethernet.
VLAN	Use the tabs associated with the sub-folders in the VLAN folder to configure or view information about VLANs, Spanning Tree, and Multi-Link Trunking. Sub-folders in the VLANs folder are: • VLANs • Spanning Tree: Globals, STG, RSTP, MSTP • MLT/LACP • SLPP
IS-IS	Use the tabs associated with the sub-folders in IS-IS to configure or view information about SPBM. • IS-IS • SPBM • Stats
IP	Use the tabs associated with the sub-folders in the IP folder to configure IP routing functions. Sub-folders in the IP folder are: • IP • TCP/UDP • OSPF • RIP

Folder	Description
	• VRRP • IGMP • DHCP Relay • UDP Forwarding • Policy
IPv6	Use the tabs associated with the sub-folders in the IPv6 folder to set up IPv6 routing functions. Sub-folders in the IPv6 folder are: • IPv6 • TCP/UDP
QoS	Use the tabs associated with the sub-folders in the QoS folder to configure quality of service and set up QoS policies and filters. Sub-folders in the QoS folder are: • QoS Devices • QoS Rules • QoS • QoS Agent • QoS UBP/Traffic Profile
Serviceability	Use the tabs associated with the sub-folders in the Serviceability folder to monitor traffic flows using IPFIX, and to monitor and configure remote monitoring. Sub-folders in the Serviceability folder are: • IPFIX • RMON: Alarms, Control • SLA monitor
Help	Use the tabs associated with the sub-folders in the Help folder to access help and support for the following: • Device Manager Basic • Support Portal (Avaya) • Support Portal (Nortel Legacy) • Legend : Up, Down, No Link, Standby, Testing, Unmanageable, and Loopback.

Example 1 - Configuring multiple Interface ports using EDM

About this task

The following procedure provides sample steps for configuring multiple interface ports using the Multiple Port Configuration function and the **Edit** > **Chassis** > **Ports** > **Interface** work flow. When you use this work flow you must first select ports on the Device Physical View.

Procedure

1. On the Device Physical View, select a port or ports.
2. From the navigation tree, double click **Edit**.
3. From the Edit tree, double click **Chassis**.
4. From the Chassis tree, click **Ports**.
5. Click the **Interface** tab.
6. To change the configuration of the selected ports, in the Multiple Port Configuration pane, double-click the cell beneath the column heading that represents the parameter you want to change and do one of the following:
   - Select a value from a drop-down list.
   - Type a value in the cell.
7. In the Make Selection pane, click **Apply Selection**.

   The changes appear in the table.
8. On the Interface tab toolbar, click **Apply** to apply the changes to the switch configuration.

Example 2 — Configuring multiple ports using EDM

The following procedure provides sample steps for configuring multiple ports using the Multiple Port Configuration function and the **Security** > **MAC Security** > **AutoLearn** workflow. When you use this, and similar workflows, you can select ports directly from the Multiple Port Configuration pane on the configuration tab. If you use the **Edit** > **Chassis** > **Ports** workflows you must first select ports on the Device Physical View.

Procedure steps

1. From the navigation tree, double click **Security**.
2. From the Security tree, click **MAC Security**.
3. Click the **AutoLearn** tab.
4. In the work area, in the Make Selection section of the Multiple Port Configuration pane, click the Switch/Stack/Ports ellipsis (...) to open the Port Editor dialog.
5. In the Port Editor window, click the ports you want to configure.

Note:

If you want to configure all ports, click **All**.

6. Click **OK** to return to the Make Selection pane.

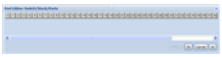
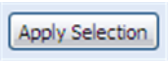
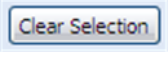
   The ports you selected appear in the Switch/Stack/Ports box.

7. To change the configuration of the selected ports, in the Multiple Port Configuration pane, double-click the cell beneath the column heading that represents the parameter you want to change and do one of the following:
   - Select a value from a drop-down list.
   - Type a value in the cell.
8. In the Make Selection pane, click **Apply Selection**.

   The changes appear in the table.

9. On the **AutoLearn** tab toolbar, click **Apply** to apply the changes to the configuration.

Job aid, buttons and dialogs on the Multiple Port Configuration pane

Button or dialog name	Button or dialog	Description
Switch/Stack/Ports:		Opens the Port Editor dialog.
Port Editor		Provides a list of all ports on the switch or stack. • Click **OK** to accept port selections and return to the Multiple Port Configuration pane. • Click **Cancel** to return to the Multiple Port Configuration pane. • Click **All** to select all ports and return to the Multiple Port Configuration pane.
Apply Selection		Applies port selections and parameter changes to the Multiple Port Configuration pane and the port data table for review.
Clear Selection		Clears Multiple Port Configuration selections.

Button or dialog name	Button or dialog	Description
Undo Apply	Undo Apply	Deletes port changes applied in the Multiple Port Configuration pane.
Hide Non-Editable	Hide Non-Editable	Displays only those parameters that are editable in the Multiple Port Configuration pane for the selected ports.

Graphing statistics

About this task

You can graph statistics for an entire device, a group of ports, or a single port.

Procedure

1. On the Device Physical View select one of the following:
   - a port
   - a group of ports
   - a device
2. In the navigation tree, double-click **Graph**.
3. In the Graph tree select one of the following:
   - **Chassis**
   - **Port**
4. On the work area, select a tab.
5. On the tab, select information to graph. To export the information to another application, on the task bar click **Export Data**.
6. To create the graph, on the task bar, click a graph type.

Getting EDM online help files for embedded EDM

Because help files are not included with the embedded EDM software files on the switch, you need to download the help files to a TFTP destination and use ACLI to configure a path from your switch to the help files. You can also use a USB mass storage device to contain help files for switches equipped with a USB port.

If you are using COM to manage your switch, help resides with COM and you do not need to use these procedures.

Downloading help files

About this task

Use the following procedure to download help files.

Prerequisites

- An available TFTP server— ensure that the TFTP path differs from the path you use to download switch software, or
- A USB mass storage device and switch equipped with a USB port

Caution:

Do not install EDM help files on PCMCIA or Flash.

Procedure

1. To obtain EDM help files for the embedded element manager, do one of the following:
   - Go to the Avaya Web site http://support.avaya.com and locate the help files for the appropriate product.
   - Select the help file from the software CD ROM.
2. Do one of the following:
   - Download the help file to a TFTP server.
   - Download the help file to a USB mass storage device.
3. Unzip the help file in the TFTP server directory.

Configuring the path to the help files using ACLI

About this task

Use the following procedure to configure the path to the help files.

Procedure

1. Open an ACLI session.
2. Enter the Global Configuration mode.
3. At the command prompt, enter the following ACLI command:

```
edm help-file-path <path name> <tftp address | usb>
<filename>
```

Variable Definitions

Field	Description
path name	Specifies the path name you created for EDM help files. The path name is stored in NVRAM.
TFTP address	Specifies EDM TFTP server IP address. Use this address only for EDM help files. If you do not specify a TFTP server address, the system uses the address specified most recently. **Warning:** Because the TFTP server address is stored in NVRAM, each time the system returns to the default configuration, you must reconfigure the path to EDM online help.
usb *<unit>*	Specifies the unit number where the USB mass storage device that contains the help files resides. The unit number is an integer from 1–8.

Configuring the help file path using EDM

About this task

Use the following procedure to configure the path to the help files.

Procedure

1. In the navigation tree, double-click **Edit** or click the Edit arrowhead to open the Edit menu.
2. Click **File System** to open the File System work area.
3. In the work area, click the **Help File Path** tab.
4. In the Help TFTP Source Directory Path field, enter the path to the help file storage location; examples, tftp://aaa.bbb.ccc.ddd/file_name, usb://file_name, or usb://unit number/file_name.

Chapter 5: Configuration files fundamentals

This chapter provides fundamental information about working with configuration files.

Configuration files are ASCII text files that allow the administrator to change switch configuration quickly.

Procedures to manage binary configuration files are included in the Enterprise Device Manager section.

Procedures for Universal Serial Bus (USB) devices apply only to switch models with USB ports.

ACLI configuration files

You can use ACLI to display, store, and retrieve configuration files, and to save the current configuration.

Configuration file management procedures

About this task

Perform the procedures in this section to display, store, restore, and save configuration files using ACLI. For more information about command variables, see ACLI command job aids on page 60.

Viewing current configuration using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Privileged EXEC ACLI mode.
2. At the prompt, enter `show running-config`.

Saving current configuration to SFTP server using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Privileged EXEC ACLI mode.
2. At the prompt, enter `copy running-config sftp [verbose] [module <applicationModules>] [filename <WORD>] ([address {<A.B.C.D> | <ipv6addr>}]) username <WORD> [password]`.

Saving current configuration to TFTP server using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Privileged EXEC ACLI mode
2. At the prompt, enter `copy running-config tftp [address {<A.B.C.D> | <WORD>}] [module <applicationModules>][filename <WORD>] [verbose]`

Saving current configuration to USB device using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Privileged EXEC ACLI mode
2. At the prompt, enter `copy running-config usb [filename <WORD>] [module <applicationModules>][unit<1-8>] [verbose]`

Saving current configuration to flash memory using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Privileged EXEC ACLI mode.
2. At the prompt, enter `copy config nvram`.

Restoring system configuration from USB device using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Priviliged EXEC ACLI mode.
2. At the prompt, enter `copy config usb {filename <name> | unit <1-8>}`.

Restoring system configuration from TFTP using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Priviliged EXEC ACLI mode.
2. At the prompt, enter `copy tftp config address <A.B.C.D> | <WORD> filename <name>`.

Restoring system configuration from SFTP using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Priviliged EXEC ACLI mode.
2. At the prompt, enter `copy sftp config address <A.B.C.D> | <WORD> filename <name> username <WORD>[password]`.

Copying stack unit configuration to standalone switch using ACLI

Procedure

1. At the command prompt, enter `enable` to enter the Privileged EXEC ACLI mode.
2. At the prompt, enter `copy [ tftp | sftp ] config address <A.B.D.C> | <WORD> filename <name> unit <unit number>`.

Downloading a configuration file automatically using ACLI

Procedure

1. Access the Privileged EXEC ACLI mode.
2. Enter the `configure network load-on-boot {disable | use-bootp | use-config} address <A.B.C.D> | <ipv6_address> filename <name>` command to configure a switch or stack to automatically load a configuration file.

ACLI command job aids

The following table describes the **`copy running-config`** command variables.

Variable	Definition
{tftp | sftp | usb}	Specifies whether to save the file to a TFTP or SFTP server or a USB mass storage device. **Note:** Not all switch models have a USB port.
address <*A.B.C.D*> | <*WORD*>	Specifies the address of the TFTP or SFTP server. • A.B.C.D—specifies the IP address • WORD—specifies the IPv6 address
filename <*name*>	Specifies the configuration file name.
username <*WORD*>	Specifies the username for downloading a configuration file automatically using ACLI.
[password]	Specifies the password for downloading a configuration file automatically using ACLI.

The following table describes the **`copy config tftp unit`** command variables.

Variable	Definition
address <*A.B.C.D*> | <*WORD*>	Specifies the address of the TFTP or SFTP server. • A.B.C.D—specifies the IP address • WORD—specifies the IPv6 address

Variable	Definition
filename *<name>*	Specifies the configuration file name.
unit *<unit number>*	Specifies the stack unit number.

The following table describes the **`configure network load-on-boot`** command variables.

Variable	Definition
load-on-boot *{disable* | *use-bootp* | *use-config}*	Specifies the setting to automatically load a configuration file when the system starts *disable* disables the automatic loading of the configuration file. *use-bootp* specifies loading the ASCII configuration file at startup and using BootP to obtain values for the TFTP or SFTP address and file name. *use-config* specifies loading the ASCII configuration file at startup and using the locally configured values for the TFTP or SFTP address and file name. If you omit the variables, the system immediately downloads and runs the ASCII configuration file.

Viewing USB files

About this task

You can display configuration files stored on a USB device in a unit in a stack. From the ACLI Privileged EXEC mode, enter the following command: `show usb-files`

Following is an output example for the show usb-files command:

```
ERS4000#show usb-files
USB file list - Stand-alone
Listing Directory USB_BULK:
657 Feb 17 2009 IP.CFG
6217432 Mar 3 2009 4000_53044.img
1589514 Feb 25 2009 4000_5303.bin
2048 Mar 4 2009 ABC/
```

Viewing USB host port information

About this task

You can display the USB host port information for a unit in a stack. From the ACLI Privileged EXEC mode, enter the following command:

```
show usb-host-port [unit <1-8>]
```

Following is an output example for the show usb-host-port command:

```
ERS4850GTS(config)#show usb-host-port
USB Host Port Info - Stand-alone Enabled
----------------------------------------
  Vendor Info      : Imation
  Product ID       : Flash Drive
  Product Revision : 1.00
  Number of Blocks : 1974271
  Bytes per Block  : 512
  Total Capacity   : 1010826752
```

Enterprise Device Manager configuration files

This section describes how to use Enterprise Device Manager (EDM) to store and retrieve configuration files.

Using EDM, you can store the current ASCII switch configuration file on a TFTP or SFTP server or a USB storage device, retrieve an ASCII configuration file from a TFTP or SFTP server or USB storage device to apply to a switch, store or retrieve a binary configuration file, or manually save the current configuration to flash memory.

You can check file upload transfer status of ASCII configuration files in the ScriptLastStatusChange field on the **Edit** > **File System** > **Ascii Config Script Files** tab. During upload transfer, the status is `manualUploadInProgress`. To check changes to file transfer status, click **Refresh**. After the file transfer is complete the status displays as either `manualUploadPassed` or `manualUploadFailed`.

You can check file download transfer status of ASCII configuration files in the ScriptLastStatusChange field on the **Ascii Config Script Files** tab. During download transfer, the status is `manualDownloadInProgress`. To check changes to file transfer status, click **Refresh**. After the file transfer is complete, the status displays as either `manualDownloadPassed` or `manualDownloadFailed`.

You can also designate an ASCII configuration file to download automatically at switch startup.

To control which ASCII configuration files load automatically, at switch startup, use the fields in the table on the **Edit** > **File System** > **Ascii Config Script Files**.

The Ascii Config Script Files table provides a way to control which ASCII configuration files are loaded, and in which order, because you can designate the path to an ASCII configuration file, a boot priority value, and a script index priority for each entry in the table.

Depending on which script source you designate for an entry, the system uses the designated paths in the Ascii Config Script Files table in one of the following ways:

- The system uses BootP to download the designated ASCII configuration file from the network, according to the specified IP address and file name.
- The system downloads the designated ASCII configuration file from a TFTP or SFTP server, according to the specified IP address and file name.
- The system downloads the ASCII configuration file from a USB device, according to the specified file name.

In the boot priority column on the Ascii Config Script Files tab, if you designate a non-zero boot priority value for any but the first row, the switch attempts to load the configuration file at startup. The first entry in the configuration files table is assigned a fixed boot priority value of 0 and it is not available to load at startup.

The switch attempts to load each ASCII configuration file with a non-zero priority value, in ascending order, until a script file loads successfully. If ASCII configuration file boot priority values are equal, the switch attempts to load the configuration files according to their script index order.

In the Script Source column on the Ascii Config Script Files table, if you designate a USB device in a standalone switch as the load-on-boot path to the ASCII configuration file, the switch downloads the specified configuration file from the USB port of the switch. If you designate a USB device in a stack unit as the load-on-boot path to the ASCII configuration file entry, the system downloads the specified configuration file from the USB port of the designated unit or, if no unit is designated, from the USB port of the base unit. If the system cannot download the configuration file, or if the script does not execute successfully, the script operational status changes to `autoDownloadFailed` and the system downloads the next entry in the table. When the configuration file downloads and executes without errors, the operational status for the entry changes to `autoDownloadPassed`.

ASCII and binary configuration file procedures

About this task

Perform the procedures in this section to use EDM to manage ASCII and binary configuration files. For more information about fields on the Config/ImageDiag file tab, used to manage binary configuration files, see Config Image Diag file tab field descriptions job aid on page 68.

Procedures for USB devices apply only to switch models equipped with USB ports.

Storing current ASCII configuration on a TFTP server using EDM

Procedure

1. From the navigation tree, double-click **Edit** to open the Edit tree.

2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.
4. Double-click the **ScriptSource** field and type the TFTP server address and the configuration file name in this format: `tftp://<ip address>/<filename>`. The entry is limited to a maximum of 327 characters.
5. Double click the **ScriptManual** field and then choose **Upload** from the list.
6. On the toolbar, click **Apply**.

Storing current ASCII configuration on a SFTP server using EDM

Procedure

1. From the navigation tree, double-click **Edit** to open the Edit tree.
2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.
4. Double-click the **ScriptSource** field and type the SFTP server address and the configuration file name in this format: `sftp://<ip address>/<filename>`. The entry is limited to a maximum of 327 characters.
5. Double click the **ScriptManual** field and then choose **Upload** from the list.
6. On the toolbar, click **Apply**.

Storing current ASCII configuration on a USB device using EDM

Procedure

1. From the navigation tree, double-click **Edit** to open the Edit tree.
2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.
4. Double-click the **ScriptSource** field and type `usb://<filename>` to store the configuration file on a USB device in a stand-alone unit or `usb://<unit number>/<filename>` to store the configuration file on a USB device in a unit in a stack.
5. Double-click the **ScriptManual** field and then choose **Upload** from the list.
6. On the toolbar, click **Apply**.

Downloading an ASCII Configuration from a TFTP server using EDM

Procedure

1. From the navigation tree, double-click **Edit** to open the Edit tree.
2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.
4. Double-click the **ScriptSource** field and type the TFTP server IP address and configuration file name in the following format: `tftp://<ip address>/<filename>`.
5. Double-click the **ScriptManual** field and then select **Download** from the list.
6. On the toolbar, click **Apply**.

Downloading an ASCII configuration from a SFTP server using EDM

Procedure

1. From the navigation tree, double-click **Edit** to open the Edit tree.
2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.
4. Double-click the **ScriptSource** field and type the SFTP server IP address and configuration file name in the following format: `sftp://<ip address>/<filename>`.
5. Double-click the **ScriptManual** field and then select **Download** from the list.
6. On the toolbar, click **Apply**.

Downloading an ASCII configuration from a USB device using EDM

Procedure

1. From the navigation tree, double-click **Edit** to open the Edit tree.
2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.

4. Double-click the **ScriptSource** field and type the configuration file name in the following format: `usb://<filename>` for a USB device in a standalone unit or `usb://<unit number>/<filename>` for a USB device in a unit in a stack.
5. Double-click the **ScriptManual** field, and then select **Download** from the list.
6. On the toolbar, click **Apply**.

Downloading a configuration file automatically using EDM

Procedure

1. From the navigation tree, double-click **Edit**.
2. Click **File System**.
3. Click the **Ascii Config Script Files** tab.
4. Double-click the **ScriptSource** field and type the TFTP server IP address and the configuration file name in the following format: **`tftp://<ip address>/<filename>`**. Substitute `usb://<filename>` to retrieve a configuration from a USB device in a stand-alone unit or `usb://<unit number>/<filename>` if the USB device resides in a unit in a stack. If you retrieve the configuration file from a BOOTP server, type `bootp://` in the **ScriptSource** field.
5. Double-click the **ScriptBootPriortity** field and type a digit between 1 and 127 for the script priority; use 0 if you are not using the entry at startup.
6. On the toolbar, click **Apply**.

Storing a binary configuration file on a TFTP server using EDM

Procedure

1. From the navigation tree, double-click **Edit**.
2. Click **File System**.
3. Click the **Config/Image/Diag file** tab.
4. In the TftpServerInetAddressType dialog, click the applicable address type button.
5. In the **TftpServerInetAddress** field, enter the TFTP server IP address.
6. In the **BinaryConfigFilename** field, enter the configuration file name.
7. In the **BinaryConfigUnitNumber** field enter the stack unit number or, for a stand-alone switch, enter `0`.

8. In the **Action** box, select **upldConfig**.
9. On the toolbar, click **Apply**.

Storing a binary configuration file on a USB device using EDM

Procedure

1. From the navigation tree, double-click **Edit** .
2. Click **File System**.
3. Click the **Config/Image/Diag file** tab.
4. In the **BinaryConfigFilename** field, enter the configuration file name.
5. In the **BinaryConfigUnitNumber** field enter the stack unit number or, for a stand-alone switch, enter `0`.
6. In the **UsbTargetUnit** field, enter the stack number where the USB device is inserted.
7. In the **Action** box, click the **upldConfigtoUsb** button.
8. On the toolbar, click **Apply**.

Downloading a binary configuration file from a TFTP server using EDM

Procedure

1. From the navigation tree, double-click **Edit** .
2. Click **File System**.
3. Click the **Config/Image/Diag file** tab.
4. In the **TftpServerInetAddress** field, enter the TFTP server IP address.
5. In the **BinaryConfigFilename** field, enter the configuration file name.
6. In the **BinaryConfigUnitNumber** field, enter the stack unit number or, for a stand-alone switch, enter `0`.
7. In the **Action** field, click the **dnldConfig** button.
8. On the toolbar, click **Apply**.

Downloading a binary configuration file from a USB device using EDM

Procedure

1. From the navigation tree, double-click **Edit** .
2. Click **File System**.
3. Click the **Config/Image/Diag file** tab.
4. In the **BinaryConfigFilename** field, enter the configuration file name.
5. In the **BinaryConfigUnitNumber** field, enter the stack unit number or, for a stand-alone switch, enter `0`.
6. In the **UsbTargetUnit** field, enter the stack unit number where the USB resides.
7. In the **Action** field, click the **dnldConfigFromUsb** button.
8. On the toolbar, click **Apply**.

Saving current configuration to flash memory manually using EDM

Procedure

1. From the navigation tree, double-click **Edit**.
2. Click **File System**.
3. Click the **Save Configuration** tab.
4. Ensure that the **AutosavetoNvramEnabled** box is not checked.
5. In the **Action** field, click the **copyConfigToNvram** button.
6. On the toolbar, click **Apply**.
7. On the toolbar, click **Refresh** to check progress.

Config/Image/Diag file tab field descriptions job aid

For more information about fields on the Config/Image/Diag file tab, see the following table.

Field name	Description
TftpServerInetAddressType	Specifies the IP version of the TFTP server address
TftpServerInetAddress	Specifies the TFTP server IP address

Field name	Description
BinaryConfigFilename	Specifies the name of the binary configuration file
BinaryConfigUnitNumber	Specifies the unit number of a switch in a stack
ImageFileName	Specifies the software image file name
FWFileName(Diagnostics)	Specifies the diagnostics file name
USBTargetUnit	Specifies the unit number containing the USB port
Action	• **dnldConfigFromUSB**—download a configuration to the switch from a USB device. • **DnldImgIfNewer**—download a new software image to the switch only if it is newer than the current image. • **dnldFw**—download a new diagnostic software image to the switch. • **dnldConfig**—download a configuration file to the switch. • **upldConfigToUsb**—upload a configuration file to a USB device. • **dnldImgNoReset**—download a new software image to the switch without a switch reset. • **dnldFwNoReset**—download a new diagnostic software image to the switch without a switch reset. • **upldConfig**—upload a configuration file to the switch from a designated location. • **dnldImg**—download a new software image to the switch. • **dnldImgFromUsb**—download a new software image to the switch from a USB device. • **dnldFwFromUsb**—download a new diagnostic software image to the switch from a USB device. • **dnldImgFromSftp**—downloads a new software image to the switch from the SFTP server. This option replaces the software image on the switch regardless of whether it is newer or older than the current image. • **dnldFwFromSftp**—downloads a new diagnostic software image to the switch from the SFTP server. This option replaces the image regardless of whether it is newer or older than the current image.

Field name	Description
	• **dnldConfigFromSftp**—downloads a configuration to the switch from the SFTP server. • **upldConfigToSftp**—uploads a configuration to the SFTP server. • **dnldImgFromSftpNoReset—**downloadsthe agent image from a SFTP server anddoes not reset the switch. • **dnldFwFromSftpNoReset—**downloads the diagnostic image from a SFTP server and does not reset the switch.
Status	Displays the status of the most recent action since last switch restart.

Chapter 6: Supported standards and Request for comments

Use this chapter as a quick reference of standards and RFCs supported by the switch.

Standards

The standards in the following list are supported on the switch:

- IEEE 802.1X (EAPOL)
- IEEE 802.3 (Ethernet)
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at Power over Ethernet Plus
- IEEE 802.3u (Fast Ethernet)
- IEEE 802.3x (Flow Control)
- IEEE 802.3z (Gigabit Ethernet)
- IEEE 802.3ab (Gigabit Ethernet over Copper)
- IEEE 802.3ae 10Gbps Ethernet
- IEEE 802.3ak 10GBase-CX4
- IEEE 802.3i 10Base-T
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.1AX Link Aggregation Control Protocol (LACP)
- IEEE 802.1ab (Link Layer Discovery Protocol)
- IEEE 802.1ag Connectivity and Fault Management
- IEEE 802.1aq (Shortest Path Bridging)
- IEEE 802.1p (Prioritizing)
- IEEE 802.1D (Spanning Tree Protocol)
- IEEE 802.1w Rapid Spanning Tree
- IEEE 802.1s Multiple Spanning Tree
- IEEE 802.1t 802.1D Maintenance
- IEEE 802.1Q (VLAN Tagging)

RFCs

For more information about networking concepts, protocols, and topologies, consult the following RFCs:

- RFC 768 UDP
- RFC 783 TFTP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet
- RFC 894 IP over Ethernet
- RFC 903 Reverse ARP
- RFC 950 / RFC 791 IP
- RFC 951 BootP
- RFC 958 NTP
- RFC 1058 RIPv1
- RFC 1112 IGMPv1
- RFC 1122 Requirements for Internet hosts
- RFC 1155 SMI
- RFC 1156 MIB for management of TCP/IP
- RFC 1157 SNMP
- RFC 1212 Concise MIB definitions
- RFC 1213 MIB-II
- RFC 1215 SNMP Traps Definition
- RFC 1340 Assigned Numbers
- RFC 1350 TFTP
- RFC 1354 IP Forwarding Table MIB
- RFC 1398 Ethernet MIB
- RFC 1442 SMI for SNMPv2
- RFC 1450 MIB for SNMPv2
- RFC 1493 Bridge MIB
- RFC 1519 Classless Inter-Domain Routing (CIDR)
- RFC 1591 DNS Client

- RFC 1650 Definitions of Managed Objects for Ethernet-like Interfaces
- RFC 1724 / RFC 1389 RIPv2 MIB extensions
- RFC 1769 / RFC 1361 SNTP
- RFC 1886 DNS extensions to support IPv6
- RFC 1908 Coexistence between SNMPv1 & v2
- RFC 1945 HTTP v1.0
- RFC 1981 Path MTU Discovery for IPv6
- RFC 2011 SNMP v2 MIB for IP
- RFC 2012 SNMP v2 MIB for TDP
- RFC 2013 SNMP v2 MIB for UDP
- RFC 2096 IP Forwarding Table MIB
- RFC 2131 / RFC 1541 Dynamic Host Configuration Protocol (DHCP)
- RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RFC 2236 IGMPv2
- RFC 2328 / RFC 2178 / RFC 1583 OSPFv2
- RFC 2453 RIPv2
- RFC 2454 IPv6 UDP MIB
- RFC 2460 IPv6 Specification
- RFC 2461 IPv6 Neighbor Discovery
- RFC 2464 Transmission of IPv6 packets over Ethernet
- RFC 2474 Differentiated Services (DiffServ)
- RFC 2541 Secure Shell protocol architecture
- RFC 2597 Assured Forwarding PHB Group
- RFC 2598 Expedited Forwarding PHB Group
- RFC 2616 / RFC 2068 HTTP 1.1
- RFC 2660 HTTPS - Secure Web
- RFC 2665 / RFC 1643 Ethernet MIB
- RFC 2674 Q-BRIDGE-MIB
- RFC 2715 Interoperability Rules for Multicast Routing Protocols
- RFC 2787 Definitions of Managed Objects for VRRP
- RFC 2819 / RFC 1757 / RFC 1271 RMON
- RFC 2851 Textual Conventions for Internet network addresses
- RFC 2863 / RFC 2233 / RFC 1573 Interfaces Group MIB

- RFC 2865 RADIUS
- RFC 2866 / RFC 2138 RADIUS Accounting
- RFC 2869 RADIUS Extensions - Interim updates
- RFC 2933 IGMP MIB
- RFC 3058 RADIUS Authentication
- RFC 3140 / RFC 2836 Per-Hop Behavior Identification codes
- RFC 3162 IPv6 RADIUS Client
- RFC 3246 Expedited Forwarding Per-Hop Behavior
- RFC 3260 / RFC 2475 Architecture for Differentiated Services
- RFC 3289 DiffServ MIBs
- RFC 3410 / RFC 2570 SNMPv3
- RFC 3411 / RFC 2571 SNMP Frameworks
- RFC 3412 / RFC 2572 SNMP Message Processing
- RFC 3413 / RFC 2573 SNMPv3 Applications
- RFC 3414 / RFC 2574 SNMPv3 USM
- RFC 3415 / RFC 2575 SNMPv3 VACM
- RFC 3416 / RFC 1905 SNMP
- RFC 3417 / RFC 1906 SNMP Transport Mappings
- RFC 3418 / RFC 1907 SNMPv2 MIB
- RFC 3513 IPv6 Addressing Architecture
- RFC 3569 Overview of Source Specific Multicast (SSM)
- RFC 3579 RADIUS support for EAP
- RFC 3584 / RFC 2576 Co-existence of SNMP v1/v2/v3
- RFC 3587 IPv6 Global Unicast Format
- RFC 3596 DNS extensions to support IPv6
- RFC 3621 Power over Ethernet MIB
- RFC 3635 Definitions of Managed Objects for the Ethernet-like Interface Types
- RFC 3768 / RFC 2338 VRRP
- RFC 3826 AES for the SNMP User-based Security Model
- RFC 3917 Requirements for IPFIX
- RFC 3954 Netflow Services Export v9
- RFC 3993 DHCP Subscriber-ID sub-option
- RFC 4007 Scoped Address Architecture
- RFC 4022 / RFC 2452 TCP MIB

- RFC 4113 UDP MIB
- RFC 4133 / RFC 2737 / RFC 2037 Entity MIB
- RFC 4193 Unique Local IPv6 Unicast Addresses
- RFC 4213 Transition Mechanisms for IPv6 Hosts & Routers
- RFC 4250 SSH Protocol Assigned Numbers
- RFC 4251 SSH Protocol Architecture
- RFC 4252 SSH Authentication Protocol
- RFC 4253 SSH Transport Layer Protocol
- RFC 4254 SSH Connection Protocol
- RFC 4291 IPv6 Addressing Architecture
- RFC 4293 IPv6 MIB
- RFC 4344 SSH Transport layer Encryption Modes
- RFC 4345 Improved Arcfour Modes for SSH
- RFC 4432 SSHv2 RSA
- RFC 4443 / RFC 2463 ICMPv6 for IPv6
- RFC 4541 Considerations for IGMP and MLD snooping switches
- RFC 4604 / RFC 3376 IGMPv3
- RFC 4673 RADIUS Dynamic Authorization Server MIB
- RFC 4675 RADIUS Attributes for VLAN and Priority Support
- RFC 4716 SSH Public Key File Format
- RFC 4750 / RFC 1850 / RFC 1253 OSPF v2 MIB
- RFC 4789 SNMP over IEEE 802 Networks
- RFC 4861 Neighbor Discovery for IPv6
- RFC 4862 / RFC 2462 IPv6 Stateless Address Auto-Configuration
- RFC 5010 / RFC 3046 DHCP Relay Agent Information Option 82
- RFC 5101 Specification of the IP Flow Information Export (IPFIX) Protocol for Exchange of IP Traffic
- RFC 5176 / RFC 3576 Dynamic Authorization Extensions to RADIUS
- RFC 5186 IGMPv3/MLDv2 and Multicast Routing Interaction
- RFC 5905 / RFC 4330 / RFC 1305 NTPv4
- RFC 6329 IS-IS Extensions Supporting Shortest Path Bridging

Chapter 7: ACLI quick reference

This chapter provides a quick reference for frequently used ACLI tasks.

For more information about using ACLI, see User interface fundamentals on page 23.

For more information about detailed configuration, see the function-specific configuration documents for this product. For the list of documents, see *Documentation Reference for Avaya Ethernet Routing Switch 4000 Series*, NN47205–101.

Connect to the switch

Two options you can use to connect to the switch are

- remote
- console

The following table lists the access method for three types of connection.

Secure Shell (SSH) enabled	SSH not enabled	Console access available
Remote access	Telnet access	Normal console connection access

Start ACLI from the main menu

To start a configuration using ACLI, choose `Command Line Interface` from the main menu.

At the prompt, use the commands in the following table.

Command	Purpose
`enable`	Enter configuration mode
`config t`	Start configuration

ACLI command modes

ACLI provides four command modes. You must enter the correct mode to perform certain functions. For more information about ACLI, see ACLI concepts on page 23.

The following is a list of ACLI command modes:

- User EXEC (exec mode)
- Privileged EXEC (privExec mode)
- Global Configuration (config mode)
- Interface Configuration (config-if mode)
- Router Configuration (config-router mode)
- Application Configuration (config-app mode)

Use the factory default configuration

Perform the commands in the following table to restart the switch using the factory default configuration.

Command	Purpose
`exit`	Exit the configuration mode.
`boot default`	Return a switch, or switches, to factory default configuration.
`restore factory-default [-y]`	Return a switch, or switches, to factory default configuration where [-y] instructs the switch not to prompt for confirmation.

Configure the management IP address

Perform the commands in the following table to configure and verify the Management IP Address.

Command	Purpose
`ip address` *<IP>* `netmask` *<mask>*	Set the management IP and mask.

Command	Purpose
`ip default-gateway` *<default gateway IP>*	Set the default gateway IP address.
`ping` *<default gateway IP>*	Verify connectivity.
`ping` *[<ipv6address> | <Hostname or A.B.C.D>] [source <WORD>]*	Verify connectivity between a source IPv4 address and another interface.
`show ip`	Verify configuration.

Note:

To dynamically change the switch IP address you must include the network mask in the command. If you currently have active management IP connections, then changing the management IP address will results in disconnecting those sessions. If Layer 3 is enabled, and you use a circuitless IP Address, you can configure up to four circuitless IP addresses on the switch or stack.

Configure Simple Network Management Protocol (SNMP)

Perform the commands in the following table to configure SNMP.

Command	Purpose
`snmp-server enable`	Enable SNMP (the default setting is disabled).
`snmp-server authentication-trap enable`	Enable authentication traps.
`snmp-server community ro`	Set the read-only community name (requirement: enter community string twice).
`snmp-server community rw`	Set the read-write community name (requirement: enter community string twice).
`snmp-server contact` *"whatever you want"*	Set contact information.
`disable`	Disables the SNMP access.
`enable`	Enables the SNMP access.
`snmp-server location` *"<Building & Closet #>"*	Set building name and closet information.

Command	Purpose
`snmp-server name` *"<switch IP address>"*	Maintain coherent Syslog messages.
`snmp-server host` *<host IP> <community>*	Set IP address of Jscan trap receiver.
`show sys-info`	Verify configuration.
`show snmp host`	Verify configuration.

Configure Network Time Protocol (NTP)

Perform the commands in the following table to configure NTP and verify the configuration.

Command	Purpose
`clock source ntp`	Set the clock source to NTP.
`default clock source`	Reset clock source to the default, SNTP.
`clock sync-rtc-with-ntp enable`	Synchronize RTC with NTP where available.
`no clock sync-rtc-with-ntp enable`	Desynchronize RTC with NTP.
`default clock sync-rtc-with-ntp enable`	Sets RTC to default – no synchronization with NTP or SNTP.
`ntp [interval]`	Enable NTP globally and specify the interval (in minutes) between NTP updates.
`default ntp [interval]`	Sets NTP globally to default (disabled) and the default interval of 15 minutes.
`ntp authentication-key <1-2147483647> <word>`	Create authentication keys for MD5 authentication (maximum of 10).
`no ntp authentication-key [ <1-2147483647> ]`	Deletes authentication keys for MD5 authentication.
`default ntp [interval]`	Sets authentication keys to the default value.
`ntp server [ <A.B.C.D> | [<IPv6_address>]`	Adds the NTP server entries.
`default ntp server [ <A.B.C.D> | [<IPv6_address>]`	Sets the NTP server entries to the default value.

Command	Purpose
`no ntp server [ <A.B.C.D> | <IPv6_address>]`	Deletes an NTP server.
`show ntp`	Displays the NTP global settings.
`show ntp key`	Displays the NTP authentication keys.
`show ntp server`	Displays the NTP server list and settings.
`show ntp statistics`	Displays the NTP statistics such as NTP server ip address, stratum, version, sync status, reachability, root delay, access attempts, server sync statistics and server fail statistics.

Configure VLANs and tagged uplinks

Perform the commands in the following table to configure VLANs and tagged uplinks.

Command	Purpose
`Vlan configcontrol automatic`	Automatically deletes old VLANs and update PVID when a VLAN is added to an untagged port (setting appears at the bottom of the VLAN configuration information).
`vlan ports <uplink port> tagging tagall`	Enables tagging on the uplink.
`vlan ports <uplink port> filter-untagged-frame enable`	Discards the untagged frames.
`vlan ports ALL filter-unregistered-frame disable`	Breaks STP for VoIP.
`vlan create <VID> type port`	Creates the port based VLAN and assign the 802.1q identifier.
`vlan name <VID> <name>`	Names the VLAN according to conventions.
`vlan menbers add <VID> <port listing>`	Add ports to appropriate VLANs.
`vlan mgmt <VID>`	Sets the management VLAN.
`vlan members remove 1 ALL`	Removes all ports from VLAN 1.
`vlan ports <uplink port> pvid <VID>`	Sets the PVID on the uplink.

Command	Purpose
`show vlan`	Verifies the VLAN configuration.
`show vlan interface info`	Verify configuration of PVID and port type.
`show vlan interface verbose <LINE>`	Verify configuration of VLAN, PVID and port type.

Configure Internet Group Management Protocol (IGMP)

Perform the commands in the following table to configure IGMP.

Command	Purpose
`[no][default]ip igmp`	Configure/restore/clear/delete IGMP settings per VLAN.
`ip igmp flush vlan <1-4094>[grp-member][mrouter]`	Flush the group member or IGMP Mrouter on selected VLAN interface
`[default] ip igmp last-member-query-interval <0-255>`	Configure/restore default last member query interval per VLAN.
`[no][default] ip igmp mrouter <portlist>`	Configure/remove multicast forwarding ports per VLAN.
`[no][default] ip igmp proxy`	Enable/disable IGMP proxy.per VLAN.
`[default] ip igmp query-max-response`	Configure/restore to default max response time in query message (1/10 of a second).per VLAN.
`[default] ip igmp query-interval<1-65535>`	Configure/restore to default query interval time per VLAN, in seconds.
`[default] igmp robust-value <2-255>`	Configure/restore to default robustness variable per VLAN.
`[no][default] ip igmp router–alert`	Configure to accept/ignore IGMP packets with router-alert option in IP header, per VLAN.
`[no][default] ip igmp snooping`	Enable/disable IGMP snooping per VLAN.
`ip igmp version <1-3>`	Set/restore to default IGMP protocol version.
`show ip igmp cache`	Display IGMP cache details
`show ip igmp group count`	Display the count of entries.

Command	Purpose
`show ip igmp group count group <A.B.C.D>`	Display the count of entries for the specified group.
`show ip igmp group count member-subnet <A.B.C.D/<0-32>>`	Display the count of entries for the specified member subnet
`show ip igmp group group <A.B.C.D>`	Display the IGMP group details for the specified group.
`show ip igmp group member-subnet <A.B.C.D>/<0-32>`	Display the IGMP group details for the specified member subnet.
`show ip igmp group member-subnet <A.B.C.D>/<0-32> group <A.B.C.D>`	Display the IGMP group details for the specified member subnet from the selected group.
`show ip igmp group-ext`	Display the IGMP group extended details.
`show ip igmp group-ext count`	Display the count of entries for IGMP group extended details
`show ip igmp group-ext group <A.B.C.D>`	Display the IGMP group extended details for the selected group.
`show ip igmp group-ext member-subnet<A.B.C.D/<0-32>>`	Display the IGMP group extended details for the selected member subnet
`show ip igmp group-ext source <A.B.C.D>`	Display the IGMP group extended details for the selected source address.
`show ip igmp interface`	Display IGMP interface information.
`show ip igmp interface vlan <1-4094>`	Display IGMP interface information for the selected VLAN.
`show ip igmp router-alert`	Display router-alert settings.
`show ip igmp router-alert vlan <1-4094>`	Display router-alert settings for the selected VLAN.
`show ip igmp snooping`	Display IGMP snooping information
`vlan igmp <VID> snooping enable`	Enable IGMP snooping on each appropriate VLAN.
`vlan igmp <VID> proxy enable`	Enable IGMP proxy on each appropriate VLAN.
`show vlan igmp <VID>`	Show IGMP information for each appropriate VLAN.

Configure a port

Perform the commands in the following table to configure a port.

Command	Purpose
`interface Ethernet`*<end-user port list>*	Enter configuration mode at the interface level where you can configure multiple ports, excluding uplink ports, simultaneously.
`auto-negotiation-advertisements 10-full 10-half 100-full 100-half pause-frame`	Set 10/100 ports to advertise only 10Mb/s half duplex and 100Mb/s half duplex.
`default auto-negotiation-advertisement`	To advertise gigabit for gigabit ports because Custom Autonegotiation Advertisements (CANA) is not appropriate for gigabit ports.
`poe poe-shutdown`	Because Power Over Ethernet (PoE) is on by default, use this command to disable PoE on non-PoE ports.
`no poe-shutdown`	Enable PoE for AP ports.
`shutdown` *[port]*	Disable unused ports.
`spanning-tree learning fast`	Set fast spanning tree leaning on access ports.
`name` *<port name>*	Name uplink ports. If you need dual uplinks, Avaya recommends that you add a second switch, in a stack, and use port 48 of the second switch as the second uplink.
`Exit`	Terminate port configuration.
`interface Ethernet` *<uplink port>*	Enter configuration mode at the interface level to configure port 48 as an uplink port.
`speed auto`	Enable autonegotiate.
`spanning-tree learning <normal or disable>`	Depending on the upstream switch location, set spanning tree to normal or disabled.
`name UP-`*<Switch IP Address>-<Slot>/<Port>*	Example: UP-128.206.95.254-1/2
`Exit`	Terminate uplink configuration.
`show interfaces all`	Display interface settings.

Configure passwords

Perform the commands in the following table to configure ACLI passwords.

Command	Purpose
`cli password serial`	Enable or disable the serial port password.
`cli password telnet`	Enable or disable Telnet and Web passwords.
`no password security`	Remove password complexity and change frequency restrictions.
`cli password read-only`	Modify the read-only password (you are required to enter the password twice).
`cli password read-write`	Modify the read-write password.
`cli password stack`	Modify stack passwords.
`cli password switch`	Modify stand-alone switch passwords.

Configure Secure Shell (SSH)

Perform the commands in the following table to configure SSH.

Command	Purpose
`ssh pass-auth`	Enable password authentication for SSH. To use SSHv2 for switch access, ensure that you use SecureCRT 4.1 or newer, Putty, or Linux SSH.
`ssh`	Enable SSH support.
`show ssh global`	Display SSH settings.
`ssh dsa-auth`	Enable DSA authentication for SSH.
`ssh rsa-auth`	Enable RSA authentication for SSH.
`ssh dsa-host-key`	Generate new SSH DSA host key.
`ssh rsa-host-key`	Generate new SSH RSA host key.

Command	Purpose
`ssh secure`	Enable SSH secure mode. Enabling secure mode will cut off all remote access. Telnet, SNMP and web will be disabled.

Configure Telnet

To disable Telnet access enter the command: `telnet-access disable`.

Configure Simple Network Time Protocol (SNTP)

Perform the commands in the following table to configure SNTP.

Command	Purpose
`sntp server {primary address <A.B.C.D> <WORD> | secondary address <A.B.C.D> <WORD>}`	Set the SNTP server address. <*A.B.C.D*> is the IPv4 address of the SNTP server in decimal notation. <*WORD*> is the primary server IPV6 address—maximum 45 characters.
`sntp enable`	Enable SNTP.
`show sntp`	Display SNTP settings SNTP. The SNTP default setting is Greenwich Mean Time (GMT).
`sync-interval`	Sets the SNTP re-synchronization interval.
`sync-now`	Forces the immediate SNTP synchronization.

Configure log settings

Perform the commands in the following table to configure log settings.

Command	Purpose
`logging volatile overwrite`	Allows the log to roll over when the buffer is full.

Command	Purpose
`logging remote address <A.B.C.D> <WORD>`	<*A.B.C.D.*> is the IP address of the remote syslog server. <*WORD*> is the remote host IPv6 address—maximum 45 characters.
`logging remote level informational`	Logs all events.
`logging remote enable`	Enables syslogging.
`logging remote secondary-address <A.B.C.D> <WORD>`	<*A.B.C.D.*> is the IP address of the remote syslog server. <*WORD*> is the remote host IPv6 address—maximum 45 characters. **Note:** The configuration of the secondary address is independent of the configuration of the first address (logging remote address command), i.e. you can configure the secondary address without configuring the first address.

Configure Secure Socket Layer (SSL)

Perform the commands in the following table to configure SSL.

Command	Purpose
`ssl certificate`	Create a certificate on the next startup. For switches that include a secure Web server Avaya recommends that you replace the generic certificate with a new certificated generated by the **`ssl certificate`** command.
`ssl`	Enables SSL server.
`ssl reset`	Resets the SSL server. When SSL is enabled: existing SSL connections are closed, the SSL server is restarted and initialized with the certificate that is stored in the NVRAM. When SSL is not enabled: existing non secure connections are closed, the server is restarted, and non secure operation resumes.
`show ssl`	Display SSL settings.

Configure access control

Configure access control by performing the commands in the following table.

Command	Purpose
`ipmgr source-ip 1 <trusted net> mask <mask>`	Enable management from the trusted net.
`ipmgr source-ip 2 <trusted net2> mask <mask>`	Enable management from trusted net 2.
`ipmgr source-ip <1-50>`	Select address or mask pair.
`ipmgr source-ip <51-100> <WORD>`	Select IPv6 address or prefix where *WORD* is the IPv6 address or prefix from which connections are allowed.
`show ipmgr`	Display access control configuration.

Check a configuration

To display the switch configuration enter the command: `show running-config`.