Fundamentals of Avaya Ethernet Routing Switch 5000 Series

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Contents

Chapter 1: Introduction

Purpose

For easy reference, basic information about user interfaces, feature licenses, use and management of configuration files, and standards and Request for Comments (RFC) supported on the 5000 Series switches appears in this document. A reference section, Quick reference for basic ACLI tasks, is included as a single source for frequently used ACLI commands.

Navigation

- User interface fundamentals on page 13
- Feature licensing fundamentals on page 57
- Configuration files fundamentals on page 69
- Supported standards and Request for Comments on page 81
- Quick reference for basic ACLI tasks on page 85

Related resources

Documentation

See the *Documentation Reference for Avaya Ethernet Routing Switch 5000 Series*, NN47200–103 for a list of the documentation for this product.

Training

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Chapter 2: New in this release

The following sections detail what's new in *Fundamentals of Avaya Ethernet Routing Switch 5000 Series*, NN47202-104 for Release 6.6.

Features

See the following sections for information about feature changes.

CLI list command

This feature provides an enhancement to the CLI `help` command, by adding a complete list of the CLI tree available on the unit, regardless of the current unit configuration. You can also use the “verbose” option to list the syntax of every CLI command.

For more information, see in this guide:

- Obtaining list of CLI tree per mode on page 18
- Obtaining list of CLI commands syntax per mode on page 19

Other changes

See the following sections for information about changes that are updates to previously existing information.

CLI interface change from FastEthernet to Ethernet

The CLI interface command `interface FastEthernet` is changed to `interface Ethernet`. The FastEthernet interface command remains available, but hidden so as to provide backward compatibility.

Removal of NSNA support

NSNA support has been removed for Avaya ERS 5600 Series starting in Release 6.6.

Chapter 3: 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.

Navigation

ACLI concepts

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

ACLI command modes occur in order of increasing privileges, each based on user logon permission level. Logon password determines user logon permission level.

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 you can load and run ACLI scripts using the configure network command, manually loading the script in the console menu, or automatically loading the script at startup. For more information about automatic configuration download, see Downloading a configuration file automatically at startup on page 72.

Navigation

ACLI command modes

This section describes the use and purpose of ACLI command modes.

ACLI command modes separate basic user tasks from control and management of the switch.

ACLI command modes are

- User Executive
- Privileged Executive
- Global Configuration
- Interface Configuration
- Application Configuration
- Router Configuration

ACLI command mode access is determined by access permission levels and password protection.

If no password is set, you can enter ACLI in User Executive mode and perform the **`enable`** command to move to the next level, Privileged Executive mode.

However, if you have read-only access, you cannot progress beyond User Executive mode, the default mode.

If you have read-write access you can progress from the default mode through all of the available modes.

User Executive mode is the default ACLI command mode and the initial access mode. Also known as exec mode, it is the most restrictive ACLI mode with only basic commands available —for example, show, ping and logoff. User Executive commands are available in the other modes.

Privileged Executive mode is an unrestricted mode that can display all switch settings. If you are logged on with write access, you can access all configuration modes and commands that affect switch operation from Privileged Executive mode.

In Privileged Executive mode, also known as privExec mode, you can perform basic switch level management tasks; for example, downloading software images, setting passwords, and starting the switch. Privileged EXEC mode commands are also available in Global, Interface, and Router configuration modes.

Global Configuration mode, also known as config mode, provides commands you can use to set and display general switch configurations such as IP address, Simple Network Management Protocol (SNMP) parameters, Telnet access, and Virtual Local Area Networks (VLAN).

Interface Configuration mode, also known as ifconfig mode, provides commands you can use to configure parameters for each port or VLAN such as speed, duplex mode, and rate limiting.

Application mode, also known as config-app mode, provides commands you can use to configure specific applications for the switch.

Router Configuration mode, also known as config-router mode, provides commands you can use to configure routing parameters for Routing Information Protocol (RIP), Open Shortest Path First (OSPF), and Virtual Router Redundancy Protocol (VRRP).

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 Executive
`5650TD-PWR>`
	No entrance command, default mode	`exit`
		or
		`logout`

Privileged Executive
`5650TD-PWR#`
	`enable`	`exit`
		or
		`logout`

Global Configuration
`5650TD-PWR(config)#`
	From Privileged EXEC mode, enter
	`configure`
		To return to Privileged EXEC mode, enter
		`end`
		or
		`exit`
		To exit ACLI completely, enter
		`logout`

Interface Configuration
`5650TD-PWR(config-if)#`
	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`

Application Configuration
`5650TD-PWR(config-app)#`
	From Global Configuration mode: To enter application mode
	`application`
		To return to Global Configuration mode, enter
		`exit`
		To return to Privileged EXEC mode, enter
		`end`
		To exit ACLI completely, enter
		`logout`

Router Configuration `5650TD-PWR(config-router)#`	From Interface Configuration mode: To configure RIP, enter	To return to Global Configuration mode, enter `exit`

Command mode and sample prompt	Entrance commands	Exit commands

	`router rip`
	To configure OSPF, enter
	`router ospf`
	To configure VRRP, enter
	`router vrrp`
		To return to Privileged EXEC mode, enter
		`end`
		To exit ACLI completely, enter
		`logout`

ACLI help

This section describes help available in ACLI.

Help is available at all levels of ACLI.

Obtaining the command list

About this task

To determine whether a command is available from the current mode, you can obtain a list of all commands available from the prompt.

Use this procedure to obtain a list of available ACLI commands.

Procedure

At the prompt, enter a question mark (`?`).

Obtaining command options

About this task

ACLI can display command options that you can use to focus command results.

Use this procedure to obtain a list of options for a command.

Procedure

At the prompt, enter a portion of a command followed by a space and a question mark (`?`).

Obtaining a command name

About this task

If you are unsure about the correct name of a command, you can enter a partial command name and ACLI displays the closest match.

Use this procedure to obtain a correct command name.

Procedure

1. At the prompt, enter a portion of the command name.
2. Press **Tab**.

Result

Example of obtaining a command name

1. At the prompt, enter `down`.
2. Press **Tab**.

   The system displays `download .`

Obtaining ACLI command modes

About this task

The help {commands | modes} command is available in all ACLI command modes.

Use this procedure to obtain a list of ACLI command modes with mode access commands.

Procedure

At the prompt, enter **`help modes`**.

Example

```
5650TD-PWR#help modes
Mode                                Short Name      Comments
----------------------------------- --------------- --------------------------
User Executive                      exec            Default mode
Privileged Executive                privExec        Enter using "enable"
Global Configuration                config          Enter using "configure"
Ethernet Interface Configuration    ifconfig        Enter using "interface"
MLT Interface Configuration         ifconfig        Enter using "interface"
Loopback Interface Configuration    ifconfig        Enter using "interface"
Application Configuration           config-app      Enter using "application"
Router RIP Configuration            config-router   Enter using "router rip"
Router OSPF Configuration           config-router   Enter using "router ospf"
Router VRRP Configuration           config-router   Enter using "router vrrp"
```

```
Router VRF Configuration              config-router   Enter using "router vrf"
Router BGP Configuration              config-router   Enter using "router bgp"
```

Obtaining ACLI commands listed by mode

About this task

The help {commands | modes} command is available in all ACLI command modes.

Use this procedure to obtain a list of ACLI commands organized by mode.

Procedure

At the prompt, enter **`help commands`**.

Obtaining list of ACLI tree per mode

About this task

Use this procedure to obtain a list of the ACLI tree per mode. This procedure lists all available ACLI command, including disabled commands, for a particular switch and software image, regardless of the current switch configuration.

Procedure

At the prompt, enter **`show cli list mode <cli_mode>`**.

Example

```
5650TD-PWR#show cli list mode config
-------------------------------------------------------
Global Configuration commands
-------------------------------------------------------
  adac                Modify ADAC settings
  application         Enter application mode
  arp                 Configure a static ARP entry
  asset-id            Conifugre the Asset-ID
  audit               Enable audit log save settings
  auto-pvid           Enable Auto-PVID (for all ports)
  autosave            Change autosave settings
  autotopology        Enable the autotopology protocol
  banner              Set custom banner info
  bgp                 Set the maximum number of ECMP path for "bgp" protocol
  cli                 Modify password settings
  clock               Global RTC configuration subcommands
  default             Set a command to its defaults
  eapol               Enable/disable EAPOL protocol
  edm                 Modify EDM settings
  end                 Exit from configure mode
...
```

Obtaining list of ACLI commands syntax per mode

About this task

Use this procedure to obtain a list of the ACLI commands syntax per mode. This procedure lists the syntax of every ACLI command, including disabled commands, for a particular switch and software image, regardless of the current switch configuration.

Procedure

At the prompt, enter **`show cli list verbose mode <cli_mode>`**.

Example

```
5650TD-PWR#show cli list verbose mode config
-------------------------------------------------------
Global Configuration commands
-------------------------------------------------------
adac {
    [ call-server-port LINE ]
    [ enable ]
    [ op-mode ] {
        [ tagged-frames ]
        [ untagged-frames-advanced ]
        [ untagged-frames-basic ]
        }
    [ uplink-port LINE ]
    [ voice-vlan <1-4094> ]
    }
adac mac-range-table low-end H.H.H high-end H.H.H
no adac
    [ call-server-port ]
    [ enable ]
    [ uplink-port ]
    [ voice-vlan ]
no adac mac-range-table
    [ low-end H.H.H high-end H.H.H ]
default adac
    [ call-server-port ]
    [ enable ]
    [ op-mode ]
    [ uplink-port ]
    [ voice-vlan ]
default adac mac-range-table
application
arp {
    [ A.B.C.D H.H.H WORD id <1-4094> ]
    [ timeout <5-360> ]
    }
no arp A.B.C.D
default arp timeout
...
```

Keystroke shortcuts

This section provides key combinations you can use to make ACLI navigation easier.

The following table describes the keystroke shortcuts.

Table 2: Keystroke shortcuts for ACLI

Key combination	Function
Ctrl+A	Start of line
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+I	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

Opening an ACLI session

Before you begin

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

About this task

Use this procedure to open an ACLI session.

Table 3: Terminal emulation program settings

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

Procedure

1. Connect to the switch.
2. Enter the password, if applicable.
3. At 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**.

Enterprise Device Manager concepts

This section provides information to start and use Enterprise Device Manager to monitor, manage, and configure Avaya Ethernet Routing Switch 5000 Series switches.

Navigation

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 Avaya Ethernet Routing Switch software, and the switch operates as a Web server, you do not require additional client software.

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 http://www.avaya.com.

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

Table 4: 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	No	Yes

EDM functions	Embedded version	Plug-in version
• user-based Device Access Control (read only and read-write) • authentication through third party (RADIUS, Microsoft AD, Sun AM)		
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

Supported Web browsers

Following is a list of Internet Web browsers supported by EDM.

- Microsoft Internet Explorer version 8.0
- Mozilla Firefox version 8.0

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 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. You can access the Avaya web site from Help in the Navigation Tree.

For procedures, to go EDM online help files for embedded EDM on page 53,Downloading help files on page 54, Configuring the help file path using EDM on page 55 and Configuring the path to the help files using ACLI on page 54,

Interface components

This section describes Enterprise Device Manager interface components.

The Enterprise Device Manager window includes the following parts:

- 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

Device Physical View

After 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 a device or stack called the Device Physical View.

Objects in the Device Physical View are

- a stand-alone switch; called a unit in the menus and dialog boxes
- a switch stack; called a chassis in the menus and dialog boxes
- 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.

To select an object, click the object—a port, a switch, or a stack. The system outlines the object in yellow, indicating that the object is selected.

To select a group of objects, you can click on an object and drag the pointer to include the group. The system outlines the group in yellow, indicating that the group of objects 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.

The following figure shows the EDM Device Physical View for a standalone switch.

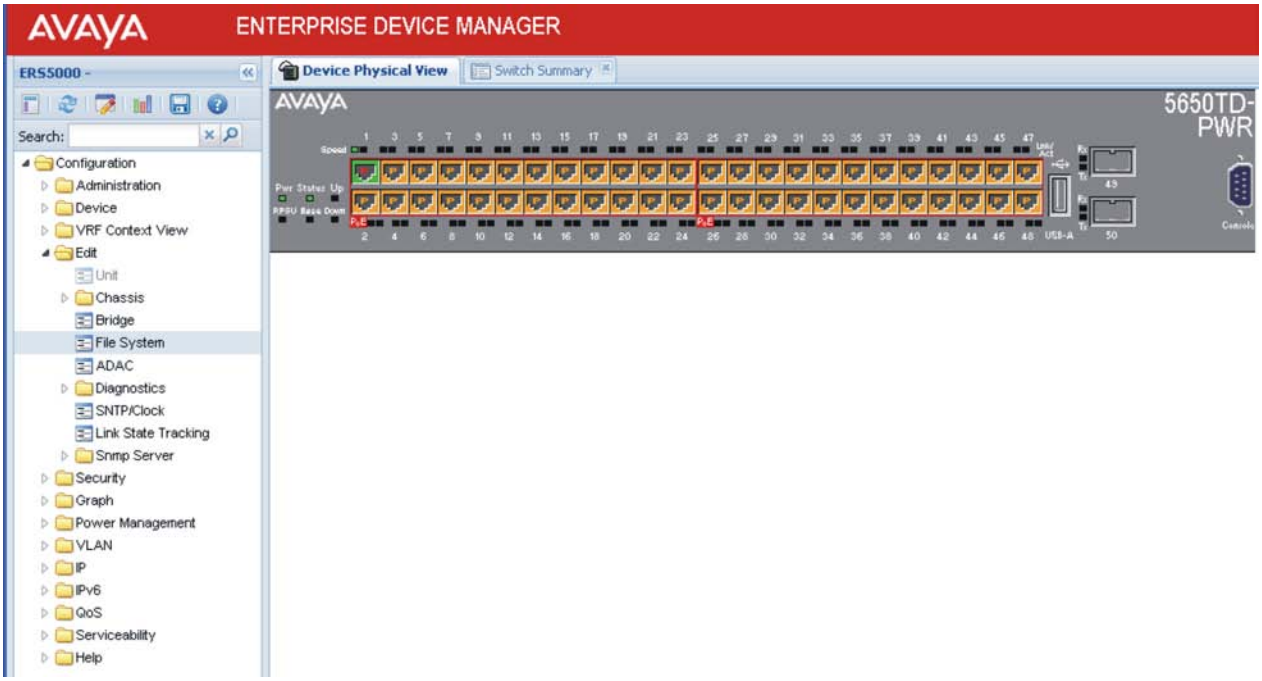


Figure 1: Device Physical View

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 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
- 3 toolbar—the area just below the menu bar that provides quick access to the most common operational commands such as **Apply**, **Refresh**, and **Help**
- 4 work area—the main area on the right side of the window that displays the dialog boxes where you view or configure switch parameters

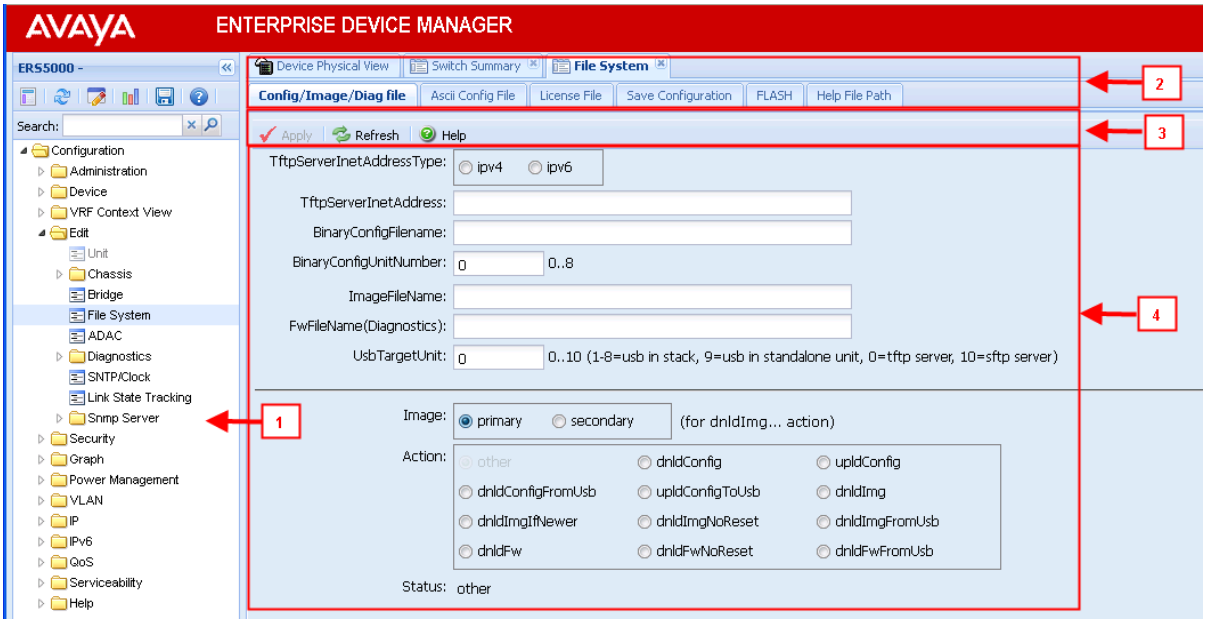


Figure 2: EDM window

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, double-click the selection in the navigation tree.

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.

After 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.

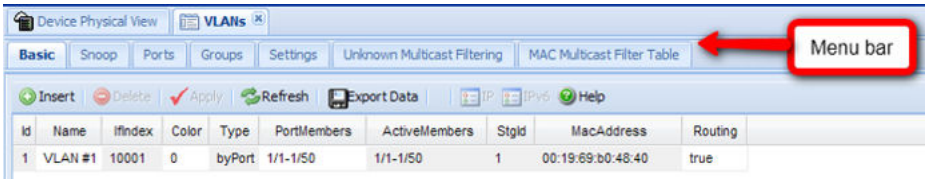


Figure 3: Menu bar

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:

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

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, you can 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.

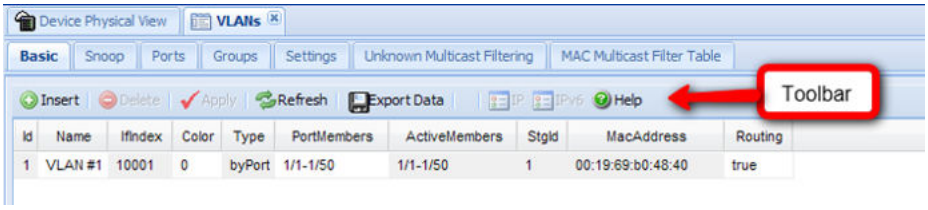


Figure 4: Tool bar

The following table describes common tool bar buttons.

Table 5: Common tool bar buttons

Button	Name	Description
	**Apply**	Executes parameter changes

Button	Name	Description
	**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
	**Cancel**	Cancels an operation

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 File System, Config/Image/Diag file dialog.

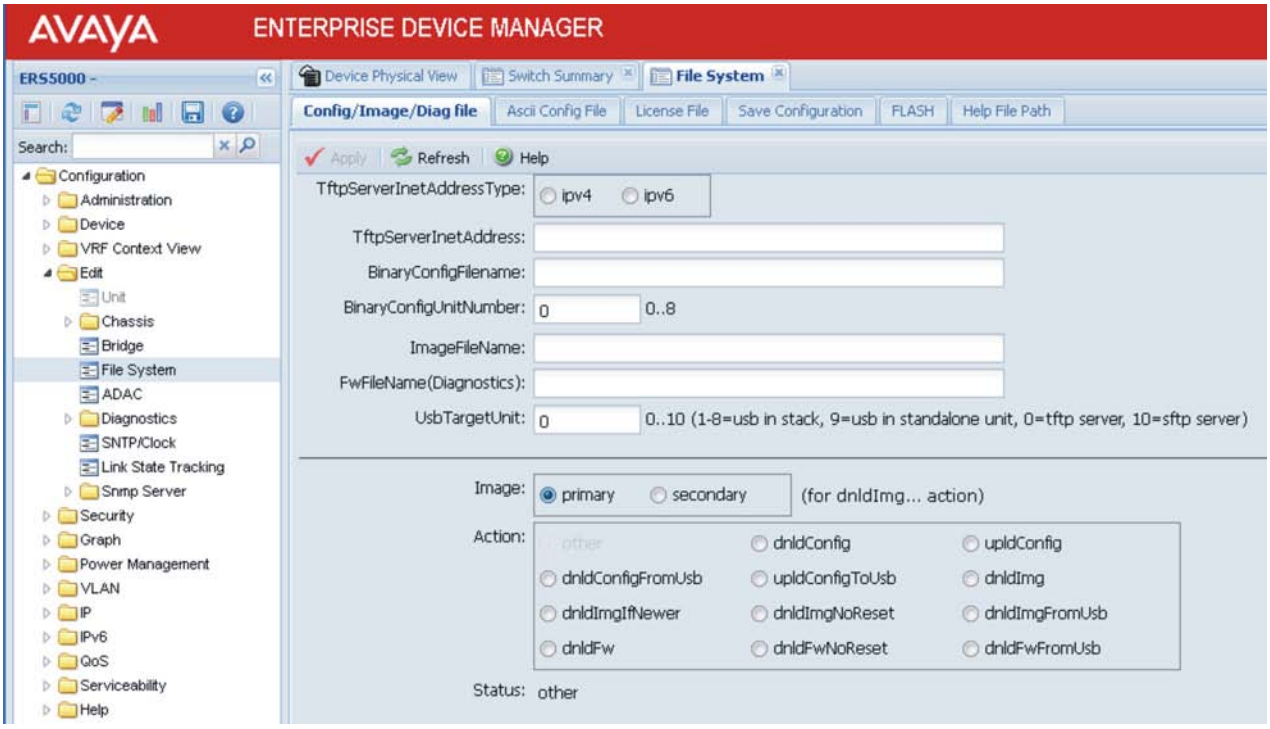


Figure 5: EDM work area

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, you can 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.

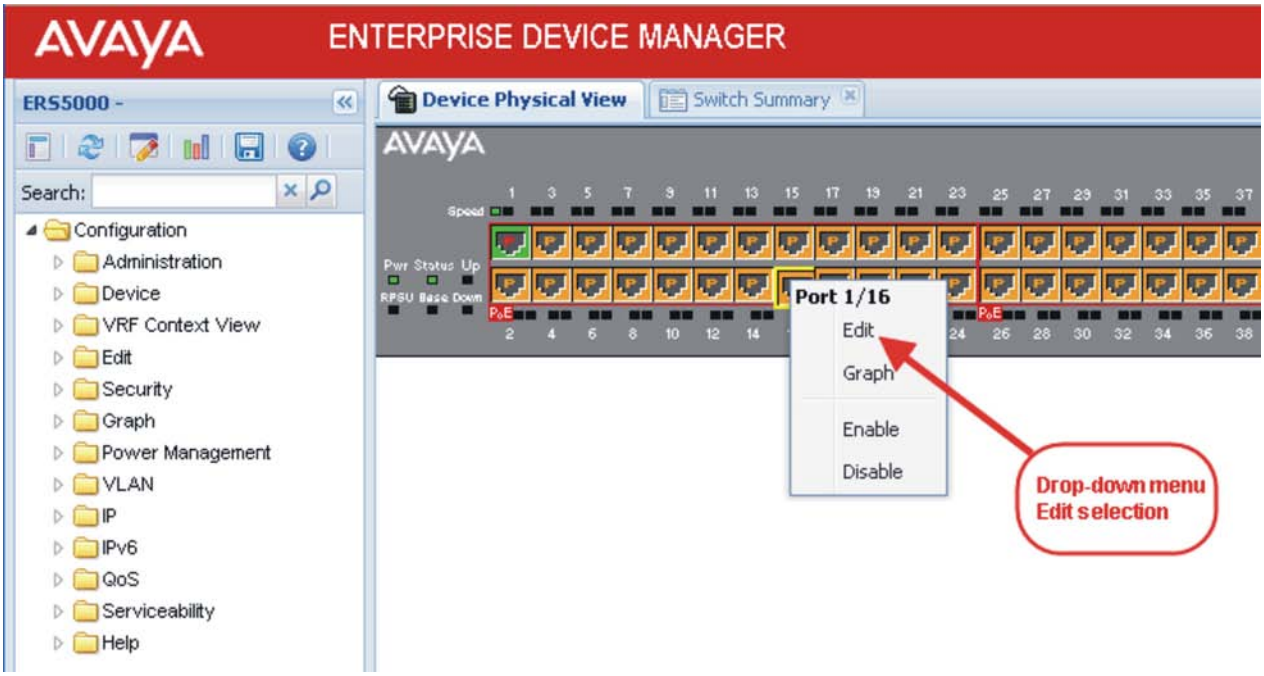


Figure 6: Device Physical View - port edit

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

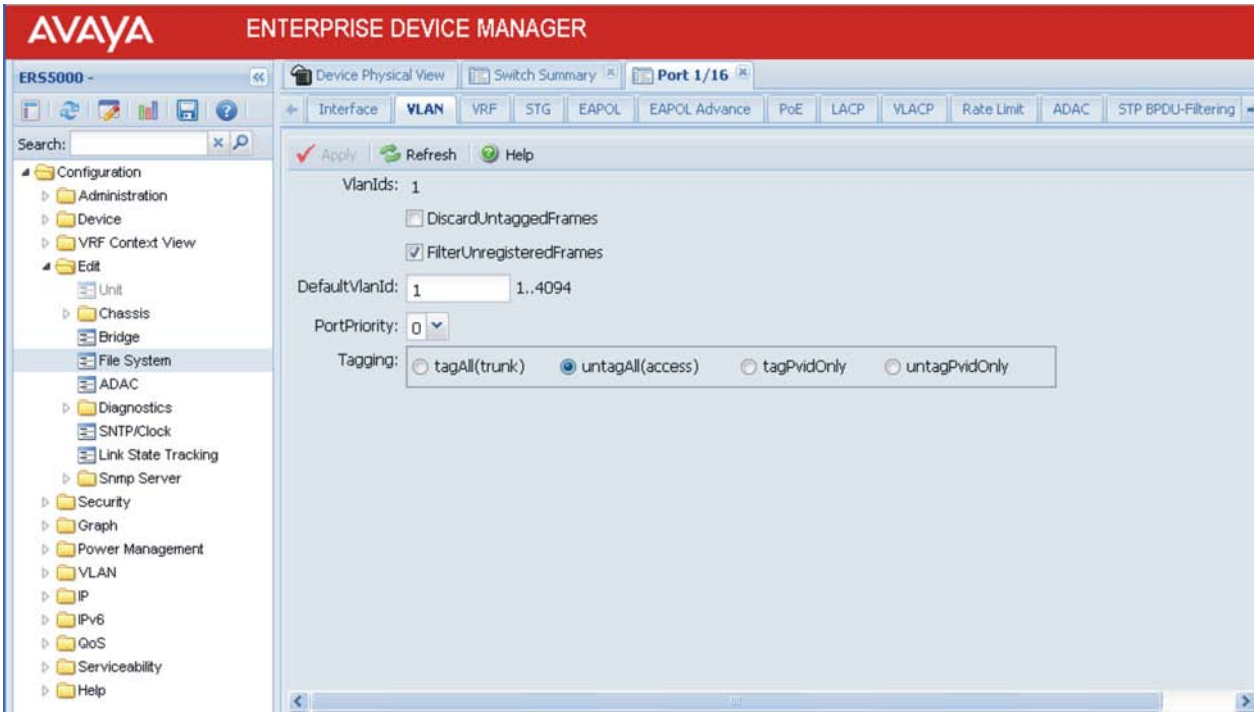


Figure 7: Port edit -VLAN tab

- From the Navigation tree you can select any tab from the Edit, Chassis, Ports work flow and double-click a cell under an editable parameter column heading in the appropriate port row of the table.

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

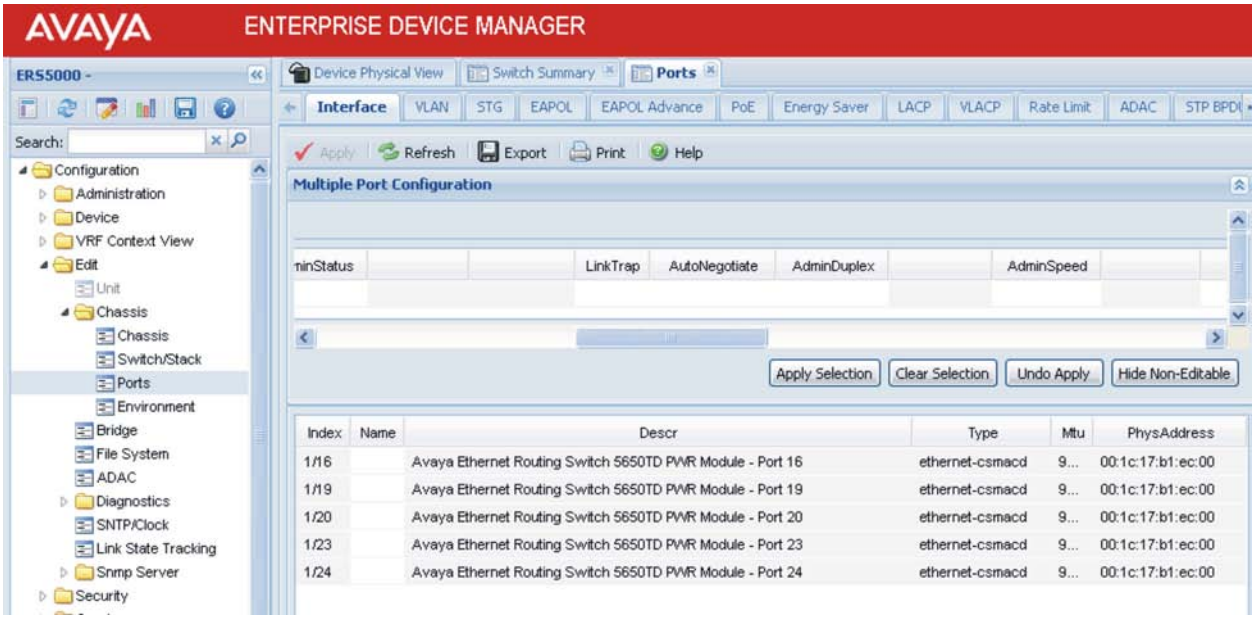


Figure 8: Edit, Chassis, Ports - Interface tab

- From the Navigation tree you can 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.

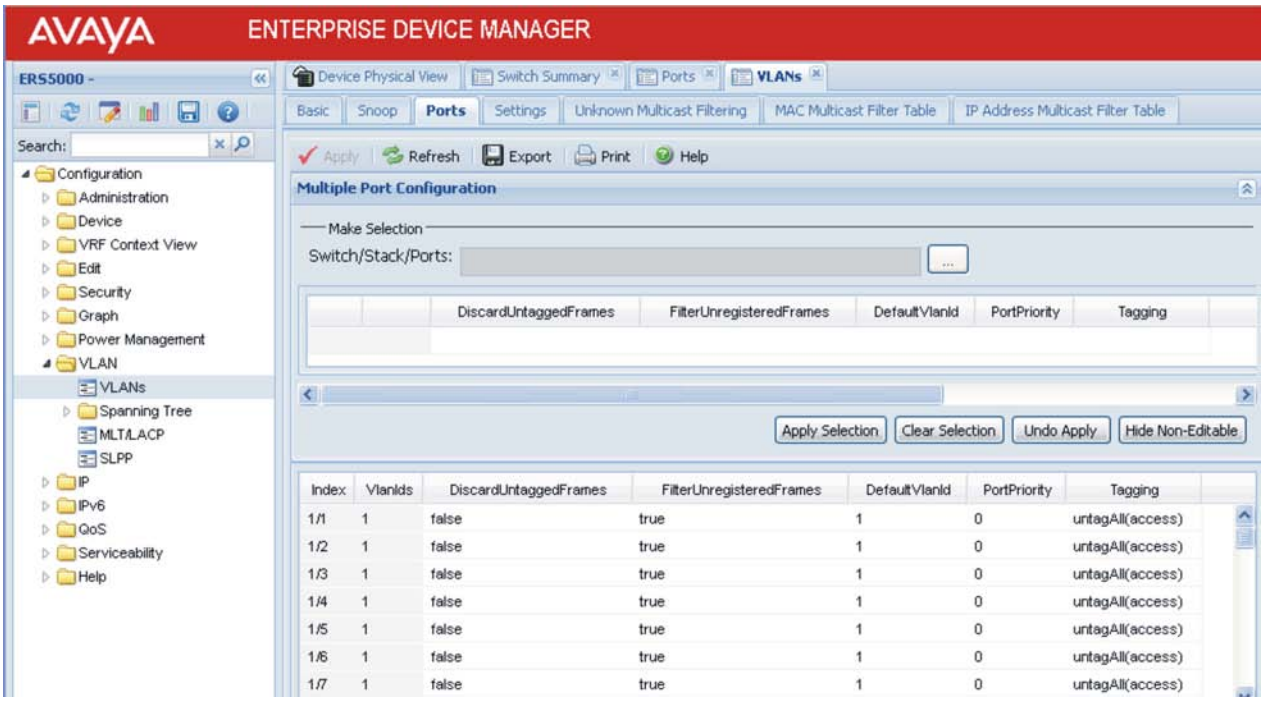


Figure 9: VLAN, VLANs - Ports tab

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 available on all tabs in the Edit, Chassis, Ports work flow, or on port-related tabs for specific, applicable feature work areas (for example, VLAN, VLANs, 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.
- 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.

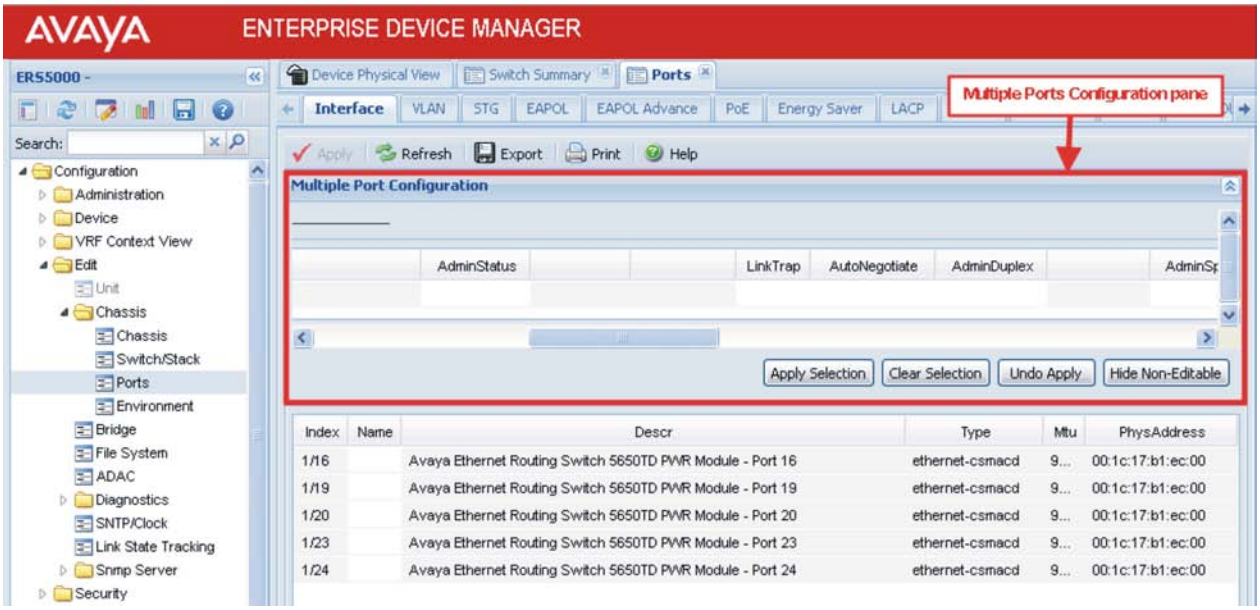


Figure 10: Interface tab - Multiple Port Configuration pane expanded

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

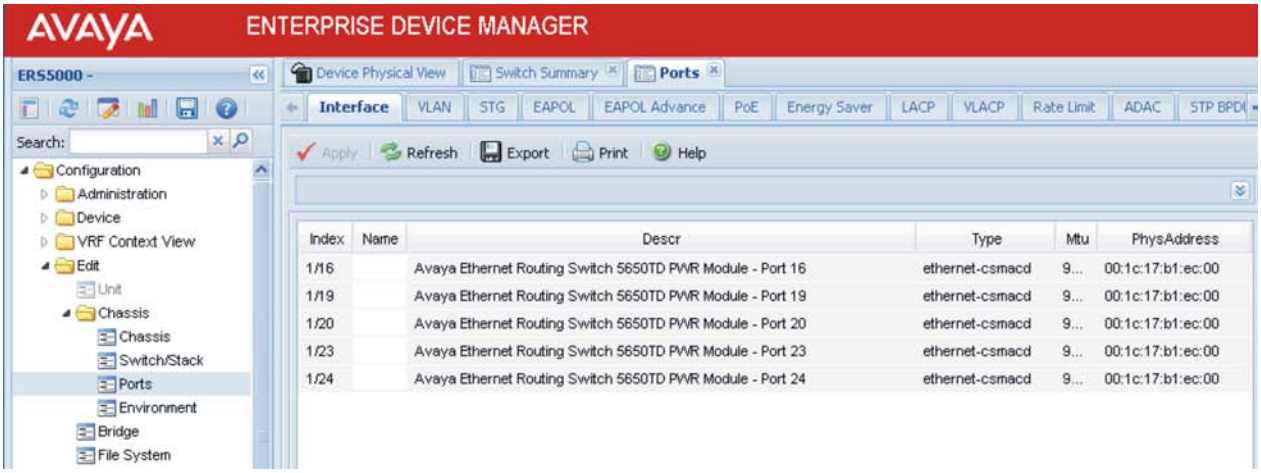


Figure 11: Interface tab - Multiple Port Configuration pane collapsed

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.

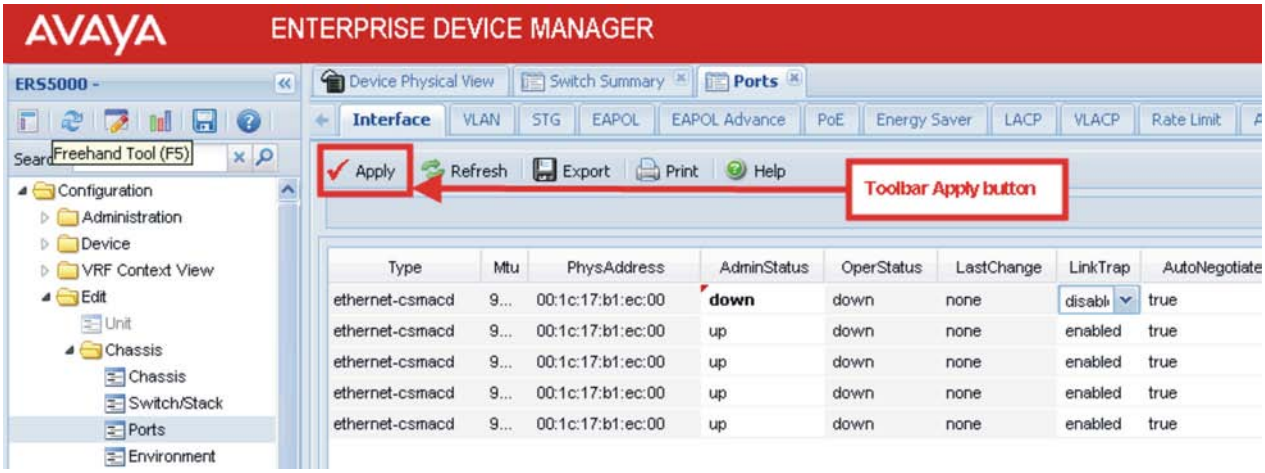


Figure 12: Toolbar Apply button

Chapter 4: 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 our PC.

Navigation

EDM configuration using ACLI

About this task

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

Navigation

Enabling the Web server using ACLI

Before you begin

- Open an ACLI session
- Access Global Configuration mode

About this task

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

If you disable 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 5000 Series*, NN47200-501.

Use the following procedure to enable the Web server using ACLI.

Procedure

Enter the following command:

```
web-server enable
```

Disabling EDM using ACLI

Before you begin

- Open an ACLI session
- Access Global Configuration mode

About this task

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

Procedure

Enter the following command:

```
no web-server
```

Displaying the Web server status using ACLI

Before you begin

- Open an ACLI session
- Access Global Configuration mode

About this task

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

Procedure

Enter the following command:

```
show web-server
```

Variable Definitions

Variable	Value
disable	Disable HTTP access
enable	Enable HTTP access
show	Shows Web server status

EDM navigation

About this task

This section describes how to configure and maintain your switch through a Web-based graphical user interface.

Navigation

- Starting EDM on page 39
- Using shortcut menus on page 40
- EDM folders and tabs on page 41

Starting 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

Use the following procedure to start EDM.

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 Port Tooltips	Refreshes the port tooltip data. Port tooltip data contains; Slot/Port, PortName, and PortOperSpeed

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

EDM folders and tabs

About this task

The following section describes how to navigate around EDM and open folders and tabs.

Navigation

- Navigating around EDM on page 41
- Undocking tabs on page 42
- Docking tabs on page 42

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. Double-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:

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

Use the following procedure to undock a tab.

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.

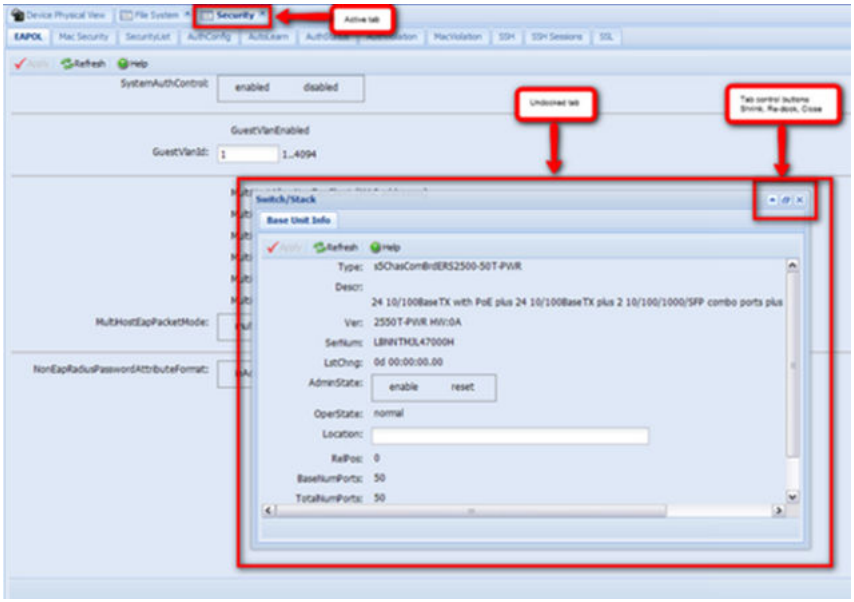


Figure 13: Undocking and docking tabs

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

EDM dialog boxes

About this task

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.

Navigation

- EDM dialog box buttons on page 43
- Editing a dialog box on page 44
- Inserting an entry in a dialog box on page 45
- Deleting an entry from a dialog box on page 45

EDM dialog box buttons

About this task

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

Table 6: 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.

Button	Description
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.
Resize Columns	Resize table columns to fit the data in them.
Stop	Stop the current action.
Copy	Copy selected items to your computer memory clipboard.
Paste	Paste the contents of your computer clipboard.
Reset changes	Reset any configuration values you changed back to their original value.
Export data	Cope data to external media.
Print Table	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.
Print (on Graph dialog boxes)	Print the current table.
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. 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**.

EDM Object configuration

About this task

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**.

Navigation

- Editing an object using the shortcut menu on page 46
- Editing file system elements on page 46
- Example - Configuring multiple Interface ports on page 50

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, and then right click
   - click and drag to select a group of objects, and then right click
   - click an entire device, and 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. Double-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 *Avaya Ethernet Routing Switch 5000 Series Fundamentals* (NN47200-104).

Job aid, tabs in the File System work area

Table 7: 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.
Boot Image	Use this tab to view information about software and diagnostics images loaded on your switch.
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

Table 8: 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 • MIB Web Page – perform a MIB Walk

Folder	Description
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 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, Topology, System Log. 802.1AB: LLDP, Port dot1, Port dot3, Port MED • SNTP/Clock • 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 • 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
IP	Use the tabs associated with the sub-folders in the IP Routing folder to configure IP routing functions. Sub-folders in the IP Routing folder are • IP • TCP/UDP • OSPF • RIP • VRRP • Multicast • IGMP • PIM • DHCP

Folder	Description
	• UDP Forwarding • Policy • VRF
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 • Tunnel • DHCP Relay
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

Example - Configuring multiple Interface ports

About this task

The following procedure provides sample steps for configuring multiple interface ports using the Multiple Port Configuration function.

Procedure

1. From the navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **Chassis**.
3. From the Chassis tree, double-click **Ports**.
4. Click the **Interface** tab.
5. 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.
6. In the Port Editor window, click the ports you want to configure.

   OR

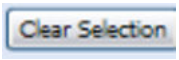
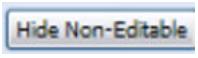
   If you want to configure all ports, click **All**.
7. Click **Ok** to return to the Make Selection pane.

   The ports you selected appear in the Switch/Stack/Ports box.
8. 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 the list.
   - Type a value in the cell.
9. In the Make Selection pane, click **Apply Selection**.

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

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

Graphing statistics

About this task

Use the following procedure to 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.

EDM online help files for embedded EDM

About this task

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.

Navigation

- Downloading help files on page 54
- Configuring the path to the help files using ACLI on page 54
- Configuring the help file path using EDM on page 55

Downloading help files

Before you begin

- 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.

About this task

Use the following procedure to download help files.

Procedure

1. To obtain EDM help files for the embedded element manager, do one of the following:
   - From the Navigation tree, double-click **Help** , click **Support Portal** and locate the help files for the appropriate product.
   - Go to the Avaya Web site http://www.avaya.com/support 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. Double-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 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: Feature licensing fundamentals

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

Navigation:

Feature licenses

This section describes the types of licenses and lists the features that require a license. You purchase switches and licenses separately.

Caution:

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

To enable certain features, Avaya Ethernet Routing Switches support

- an Advanced or Premier License
- a Trial License

Licenses support the following features (under an Advanced License unless otherwise noted):

- IPv6 Forwarding
- Split MultiLink Trunking (SMLT)
- Open Shortest Path First (OSPF)
- Virtual Router Redundancy Protocol (VRRP)
- Equal Cost Multi Path (ECMP)
- Protocol Independent Multicast-Sparse Mode (PIM-SM)
- Border Gateway Protocol (BGP)
- VRF-LIte (Premier License required)

To enable Premier License features on an Avaya Ethernet Routing Switch 5000 Series, you must

- purchase a Premier License Kit
- generate a license file on the Avaya electronic licensing portal
- install a license file on the switch

Each License Kit contains

- a Software License Certificate
- a License Authorization Code (LAC) for a specific number of licenses

The License Certificate contains printed instructions that describe how to

- deposit license entitlements (LACs) into a license bank
- enter switch MAC addresses
- generate the license file
- install the license file on a switch to unlock licensed features

You can install a one time Trial License to enable licensed features on a switch for 30 days. You can obtain the trial license on the Avaya Web site. Configure Trial License Support through Avaya Command Line Interface (ACLI) or the ASCII Configuration Generator (ACG). Software monitors and tracks the trial version of the feature license.

At the end of the 30 day trial period, the system disables all of the licensed features except Split MultiLink Trunking (SMLT). To prevent loop formation, SMLT remains active until you reset the stack or unit.

To minimize network impact, the following events occur prior to Trial License expiry:

- Five days prior to license expiration the system sends a trap. Avaya recommends that you manually disable SMLT and remove cabling loops after you receive the first trap because, after you reset the stack or unit, a loop forms if you do not disable ports participating in the InterSwitch Trunk (IST).
- One day prior to license expiration the system sends a second trap.
- The system sends a final trap at license termination.
- The system disables all licensed features, except SMLT, after it sends the final trap.

See the following table for the text of the traps you receive prior to, and at, Trial License termination.

Table 9: Trial license traps

Days prior to Trial License termination	Trap text
Five	`Trap: bsnTrialLicenseExpiration: Trial license 1 will expire in 5 day(s).`

Days prior to Trial License termination	Trap text
One	`Trap: bsnTrialLicenseExpiration: Trial license 1 will expire in 1 day(s).`
At Trial License termination	`Trap: bsnTrialLicenseExpiration: Trial license 1 has expired.`

License file generation

This section describes what you must do after you purchase a License Kit.

After you purchase a License Kit, you must generate the license file on the Avaya licensing portal at http://www.avayadatalicensing.com. The Avaya licensing portal acts as a license bank —an electronic repository for all license entitlements and licenses.

The License Certificate in the License Kit contains the License Authorization Code (LAC). After you enter the LAC on the licensing portal, the system deposits license entitlements into your license bank. Then you can use one or more switch MAC addresses to generate a license file. Because the system generates the software license file based on the switch MAC address, the license file must contain the authorized MAC addresses of the switches where the license file is installed.

You can generate an individual license file with one or multiple switch MAC addresses and you can add MAC addresses to the same license file at a later time. One license file can support up to 1000 unique MAC addresses.

To support licensed features in a switch stack, ensure that you generate the license from the MAC address of the base unit.

To ensure that licensed features continue to operate if the Base Unit (BU) in a switch stack fails, Avaya recommends that you also enter the MAC address of the Temporary Base Unit (TBU), in addition to the MAC address of the BU, when you generate a license file for a stack of two or more switches.

You can purchase License Kits in combinations. For example, to enable licensed features for 22 MAC addresses, order one AL1016001 kit and one AL1016002 kit. The two kits provide licenses for a total of 22 MAC addresses.

The following table provides the License Kit order codes, license type descriptions, and number of licenses supported for each license kit.

Table 10: License kit order codes

Part number/ order code	License type and description	Number of switches or MAC addresses supported
AL1016001	Avaya Ethernet Routing Switch 5000 Advanced License Kit, for 1 switch/stack. Enabled features: IPFIX, SMLT, OSPF, ECMP, VRRP and PIM-SM (one license required for each stack or standalone unit).	1 switch/stack (2 MAC addresses)
AL1016002	Avaya Ethernet Routing Switch 5000 Advanced License Kit, for up to 10 switches/stacks. Enabled features: IPFIX, SMLT, OSPF, ECMP, VRRP and PIM-SM (one license required for each stack or standalone unit).	10 switches/stacks (20 MAC addresses)
AL1016003	Avaya Ethernet Routing Switch 5000 Advanced License Kit, for up to 50 switches/stacks. Enabled features: IPFIX, SMLT, OSPF, ECMP, VRRP and PIM-SM (one license required for each stack or standalone unit).	50 switches/stacks (100 MAC addresses)
AL1016004	Avaya Ethernet Routing Switch 5000 Advanced License Kit, for up to 100 switches/stacks. Enabled features: IPFIX, SMLT, OSPF, ECMP, VRRP and PIM-SM (one license required for each stack or standalone unit).	100 switches/stacks (200 MAC addresses)

After you receive the license file, to access licensed features, you must install the license file on the switch.

Generating a license

Before you begin

- Purchase a License Kit containing a License Certificate with a License Authorization code (LAC). For more information, contact your Avaya sales representative.
- Ensure that a properly configured TFTP server resides in your network.
- Assign IP addresses to all switches.
- Obtain the switch base MAC addresses for the switches that use licensed features—perform ACLI command `show sys-info` to obtain base MAC addresses.

- Ensure that your browser does not automatically decompress the compressed binary license file.
- After you create the license file at the site identified in the License Kit, you must specify a file name; example: building100_ers5000.lic.

License file names must conform to the following restrictions:

- maximum of 63 alphanumeric characters
- lower case only
- no spaces or special characters permitted
- underscore (_) permitted
- doc (.) and a three character file extension required

If you need to include multiple MAC addresses in a license file, use a text-based file that conforms to the following rules:

- ASCII file format
- one MAC address on a line
- no other characters, spaces, or special characters permitted
- MAC addresses in hexadecimal, capitalized format, each pair of characters separated by colons: example, (XX:XX:XX:XX:XX:XX)
- file must contain correct MAC addresses—incorrect MAC addresses result in licensed features not working on designated units
- number of MAC addresses must not exceed the number of MAC addresses allowed for the LAC entered for a file as described in the following table:

About this task

Use this procedure to generate a license file.

Procedure

1. Use a Web browser to go to the Avaya licensing portal at http://www.avayadatalicensing.com.
2. Type your contact information in the required boxes.
3. Create a new license bank or provide details of an existing license bank.
4. Select an E-mail notification option to receive newly generated licenses—after the system generates the license file, it is sent by e-mail to the address you specified.
5. Enter the License Authorization Code provided on the License Certificate.
6. Click **Submit**, and then wait for the confirmation message.
7. After you receive the confirmation message, click **Go to License Bank to Download License**.
8. In the License Bank window, select the LAC for the license you want to generate.
9. Click **Generate License**.

10. In the Generate License window, enter the MAC address of the switch or the MAC address of the Base Unit (BU) and Temporary Base Unit (TBU) of the stack, or a text file that contains a list of MAC addresses, enter the license file name, and enter additional details as required.
11. Click **Generate License File**.

License file installation

This section describes what you must do after you generate the license file.

After you obtain the license file, you must install the license file on the switch to unlock the licensed features.

You can install a license file in flash memory or on a TFTP server.

Provided that you name the license file in accordance with accepted file naming conventions, you can apply your choice of file name and extension to a license file generated on the Avaya licensing portal.

Do not specify a license file location—the system records and stores the license file name while you copy the license file to the switch.

This section contains information about the following topics:

Installing a license file using ACLI

Before you begin

- Store the license on a TFTP server.
- Ensure that you have the correct license file—the license file contains the MAC address of the switch where you are installing the license.
- Ensure that your browser does not automatically decompress the compressed binary license file.
- Enable Autosave or save the current configuration to flash memory.

About this task

Use this procedure to use ACLI to install a license file on a switch.

Important:

If you reset the switch to default, you must reinstall the license file on the switch, and restart the switch, to reactivate the licensed features. The reset removes the software license from the switch because the system stores the license file in nonvolatile random access memory (NVRAM).

Procedure

1. 1 Use the following command from Privileged EXEC mode: .
   ```
   copy tftp license <A.B.C.D> <WORD>
   ```
2. Restart the switch.

   Important:

   Avaya recommends that you schedule switch restart during a normal maintenance window.

Variable Definitions

Table 11: Copy tftp license command parameters

Variable	Value
<*A.B.C.D*>	TFTP server address
<*WORD*>	Software license file name on the TFTP server

Displaying an existing software license using ACLI

About this task

Use this procedure to display the license installed on the switch.

Procedure

At any command prompt, enter:

```
show license { <1-10> | all}
```

Variable Definitions

Table 12: Show license command parameters

Variable	Value
<1-10>	Displays the selected licenses
all	Displays all licenses

Deleting an existing license using ACLI

About this task

Use this procedure to delete the software license file from the switch.

Procedure

Use the following command from Privileged EXEC mode:

```
clear license { <1-10> | all}
```

Variable Definitions

Table 13: Clear license command parameters

Variable	Value
<1-10>	Displays the selected licenses
all	Displays all licenses

Installing a license file using Enterprise Device Manager

About this task

Use this procedure from Enterprise Device Manager to install a license file on a switch.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **License File** tab.

4. In **TftpServerInetAddressType**, select the system IP version.
5. In **TftpServerInetAddress**, enter the TFTP server IP address.
6. In **LicenseFileName**, enter the software license file name.
7. In **UsbTargetUnit**, type a value.
8. In **LicenseFileAction**, click a radio button.
9. In **Remove License**, select from the drop-down menu.
10. Click **Apply**.
11. The system generates a restart warning message; click **Yes** to restart the switch and then activate the license, or click **No** to cancel license installation.

Variable Definitions

Table 14: License File tab parameters

Variable	Value
TftpServerInetAddressType	The system IP version
TftpServerInetAddress	TFTP server IP address
LicenseFileName	Name of the license file
UsbTargetUnit	Specifies the USB target. Value of 1–8 is USB in a stackk unit, 9 is USB in a standalone unit, 0 is TFTP, 10 is SFTP.
LicenseFileAction	Select **dnldLicense** to download the license file from the TFTP server or **dnldLicenseFromSftp** to download the license file from the SFTP server.
LicenseFileStatus	Indicates the current license file action.
InstalledLicense	Indicates the installed license type.
OperationalLicense	Indicates the currently operational license type.
Remove License	Specifies the number of licenses to remove. Value of none, 1–10, or all.

License file transfer

Licensing Auto Unit Replacement (AUR) is available on Avaya Ethernet Routing Switch 5000 Series switches. If a base unit in a stack fails, the other units in the stack automatically transfer

a virtual key to the new base unit. AUR eliminates the need for manual license transfer to the new base unit.

However, there are still situations that require manual license transfer from one device to another.

Under the following conditions, you need to transfer a license on the Avaya Licensing portal:

- replacement of a failed non base unit (NBU)
- incorrect MAC address entered on the Avaya License portal during license file generation
- the system displays an error message indicating that you exceed the number of MAC address swaps for a license—for each License authorization Code (LAC) you can swap up to 10% of the MAC addresses; contact Avaya Technical Support to obtain a new LAC

Use the following procedure to transfer a license.

Transferring a license

About this task

Use this procedure to transfer a license from one switch to another.

Procedure

1. In the Web browser, go to the Avaya licensing portal at http://www.avayadatalicensing.com/.
2. Click **License Bank**.
3. Enter your user name and password.
4. In the License Bank, select the License Authorization Code (LAC) entry associated with the license type.
5. Click **View Details**.
6. Select a transaction that contains the license file name from the switch you are replacing.
7. Click **Replace Switch**.
8. In Step 1: Enter Replacement MAC Address, enter the new MAC address.
9. In Step 2: select the MAC Address to Replace, select the entry for the MAC address that you want to replace.
10. Click **Replace Switch MAC**. If you exceed the MAC replacement threshold, a message appears confirming that the MAC swap is unsuccessful.
11. Select a different LAC entry and try again. If no other LAC entries appear in the list, contact Avaya Technical Support.

12. After the system displays `MAC swap successful` , click **Return to License Bank Details**.
13. Select the transaction that contains the license file name with the new MAC address.
14. Click **Download**.

Chapter 6: Configuration files fundamentals

This chapter provides fundamental information about working with configuration files.

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

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.

Navigation

ACLI configuration files

This section provides procedures that you can use to display, store, and retrieve configuration files, and to save the current configuration by using Avaya Command Line Interface (ACLI). Procedures for Universal Serial Bus (USB) devices apply only to switch models with USB ports.

Navigation

Agent and diagnostic software status display

You can display the currently loaded and operational switch or stack software status for both agent and diagnostic loads. With the **`show boot`** ACLI command and variables, you can view

the agent or diagnostic load status individually, or together. The Boot Image, EDM tab displays agent and diagnostic load status information together.

Viewing the current configuration

About this task

Use this procedure to display the current configuration.

Procedure

Use the following command from Privileged EXEC mode:

```
show running-config
```

Saving the current configuration

About this task

Use this procedure to save the current configuration to a TFTP server or USB device.

Procedure

Use the following command from Privileged EXEC mode:

```
copy running-config {tftp | (usb) [u2]} address <A.B.C.D>
filename <name>
```

Variable Definitions

Table 15: Copy running config command parameters

Variable	Value
address <A.B.C.D>	Specifies the TFTP server IP address.
filename <name>	Specifies the configuration file name.
{tftp | usb}	Specifies whether to save the file to a TFTP server or a USB mass storage device—not all switch models have a USB port.

Saving the current configuration to flash memory

About this task

Use this procedure to save the current configuration to flash memory (NVRAM).

Procedure

Use the following command from Privileged EXEC mode:

```
copy config nvram
```

Restoring a system configuration from a USB device

About this task

Use this procedure to copy a configuration stored on a USB device.

Procedure

Use the following command from Privileged EXEC mode:

```
copy usb config filename <name>
```

Restoring a system configuration from a TFTP server

About this task

Use this procedure to copy a configuration stored on a TFTP server.

Procedure

Use the following command from Privileged EXEC mode:

```
copy tftp config address <A.B.C.D> filename <name>
```

Copying a stack unit configuration to a stand-alone switch

About this task

Use this procedure to copy a stack unit configuration to a stand-alone switch.

Procedure

Use the following command from Privileged EXEC mode:

```
copy tftp config address <A.B.D.C> filename <name> unit <unit
number>
```

Variable Definitions

Table 16: Copy tftp config unit command parameters

Variable	Value
address <A.B.C.D>	Specifies the TFTP IP address.
filename <name>	Specifies the configuration file name.
unit <unit number>	Specifies the stack unit number.

Downloading a configuration file automatically at startup

About this task

Use this procedure to download a configuration automatically at switch startup.

Procedure

Use the following command from Privileged EXEC mode:

```
configure network load-on-boot {disable | use-bootp |use-
config} address <A.B.C.D> filename <name>
```

Variable Definitions

Table 17: Configure network load-on-boot command parameters

Variable	Value
load-on-boot {disable | use-bootp | use-config}	Specifies the setting to automatically load a configuration file while 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 address and file name. *use-config* specifies loading the ASCII configuration file at startup and using the locally configured values for the TFTP address and file name. If you

Variable	Value
	omit the variables, the system immediately downloads and runs the ASCII configuration file.

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 server or a USB storage device, retrieve an ASCII configuration file from a TFTP 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 tab.

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 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. After the configuration file downloads and executes without errors, the operational status for the entry changes to `autoDownloadPassed` .

You can use the procedures in this section to

- save the current ASCII configuration file on a TFTP server
- save the current ASCII configuration on a USB storage device
- retrieve an ASCII configuration file, from a TFTP server, to apply to a switch
- retrieve an ASCII configuration file, from a USB storage device, to apply to a switch
- save a binary configuration file
- retrieve a binary configuration file
- manually save the current configuration to flash memory

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

- Storing the current ASCII configuration file on a TFTP server using EDM on page 75
- Storing the current ASCII configuration file on a USB device using EDM on page 75
- Downloading an ASCII configuration file from a TFTP server using EDM on page 76
- Downloading an ASCII configuration file from a USB device using EDM on page 76
- Downloading an ASCII configuration file automatically using EDM on page 77
- Storing a binary configuration file on a TFTP server using EDM on page 77
- Storing a binary configuration file on a USB device using EDM on page 78
- Downloading a binary configuration file from a TFTP server using EDM on page 78
- Downloading a binary configuration file from a USB device using EDM on page 79

- Saving the current configuration to flash memory manually using EDM on page 79
- Config/Image/Diag file tab field descriptions job aid on page 80

Storing the current ASCII configuration file on a TFTP server using EDM

About this task

Use this procedure to save the current ASCII configuration file on a TFTP server.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Ascii Config File** tab.
4. In **TftpServerInetAddress**, type the TFTP server address.
5. In **AsciiConfigFilename**, type the configuration file name.
6. In **AsciiConfigManualUpload**, click **uploadNow**.
7. On the toolbar, click **Apply**.

Storing the current ASCII configuration file on a USB device using EDM

About this task

Use this procedure to save the current ASCII configuration file on a USB device.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Ascii Config File** tab.
4. In **TftpServerInetAddress**, type the configuration file name.
5. In **UsbTargetUnit**, enter the stack unit number where the USB device is inserted.
6. In **AsciiConfigManualUpload**, click **uploadToUsb**.
7. On the toolbar, click **Apply**.

Downloading an ASCII configuration file from a TFTP server using EDM

About this task

Use this procedure to download an ASCII configuration file from a TFTP server.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Ascii Config File** tab.
4. In **TftpServerInetAddress**, type the TFTP server IP address.
5. In **AsciiConfigFilename**, type the configuration file name.
6. In **AsciiConfigManual-Download**, click **downloadNow** to transfer the file from the TFTP server to the switch.
7. On the toolbar, click **Apply**.

Downloading an ASCII configuration file from a USB device using EDM

About this task

Use this procedure to download an ASCII configuration file from a USB device.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Ascii Config File** tab.
4. In **TftpServerInetAddress**, type the configuration file name.
5. In **UsbTargetUnit**, enter the stack unit number where the USB device is inserted.
6. In **AsciiConfigManual-Download**, click **downloadFromUsb** to transfer the file from the USB device to the switch.
7. On the toolbar, click **Apply**.

Downloading an ASCII configuration file automatically using EDM

About this task

Use this procedure to download an ASCII configuration automatically at switch startup.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Ascii Config File** tab.
4. In **TftpServerInetAddress**, type the TFTP server IP address.
5. In **AsciiConfigFilename**, type the configuration file name.
6. From **AsciiConfigAutoDownload**, click the appropriate download option: **disabled** to disable automatic download, **useBootp** to obtain TFTP server connection settings, or **useConfig** to use the TFTP settings on screen to connect to the TFTP server.
7. On the toolbar, click **Apply**.

Storing a binary configuration file on a TFTP server using EDM

About this task

Use this procedure to store a binary configuration file on a TFTP server.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Config/Image/Diag File** tab.
4. In **TftpServerInetAddress**, enter the TFTP server IP address.
5. In **BinaryConfigFilename**, enter the configuration file name.
6. In **Action**, click **upldConfig**.
7. On the toolbar, click **Apply**.

Storing a binary configuration file on a USB device using EDM

About this task

Use this procedure to store a binary configuration file on a USB device.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Config/Image/Diag File** tab.
4. In **BinaryConfigFilename**, enter the configuration file name.
5. In **UsbTargetUnit**, enter the stack unit number or, for a stand-alone switch, enter 0.
6. In **Action**, click **upldConfigtoUsb**.
7. On the toolbar, click **Apply**.

Downloading a binary configuration file from a TFTP server using EDM

About this task

Use this procedure to download a binary configuration file from a TFTP server.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Config/Image/Diag File** tab.
4. In **TftpServerInetAddress**, enter the TFTP server IP address.
5. In **BinaryConfigFilename**, enter the configuration file name.
6. In **Action**, click **dnldConfig**.
7. On the toolbar, click **Apply**.

Downloading a binary configuration file from a USB device using EDM

About this task

Use this procedure to download a binary configuration file from a USB device.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Config/Image/Diag File** tab.
4. In **BinaryConfigFilename**, enter the configuration file name.
5. In **UsbTargetUnit**, enter the stack unit number where the USB is inserted.
6. In **Action**, click **dnldConfigFromUsb**.
7. On the toolbar, click **Apply**.

Saving the current configuration to flash memory manually using EDM

About this task

Use this procedure to save the current configuration to flash memory manually.

Procedure

1. From the Navigation tree, double-click **Edit**.
2. From the Edit tree, double-click **File System**.
3. Select the **Save Configuration** tab.
4. Deselect **AutosavetoNvramEnabled** to disable automatic flash memory storage of the current configuration.
5. In **Action**, select **copyConfigToNvram**.
6. On the toolbar, click **Apply**.
7. Click **Refresh** to check progress of the configuration download.

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
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
Image	Specifies either primary or secondary when used in conjunction with the dnldImg action.
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
Status	Displays the status of the most recent action since last switch restart.

Chapter 7: Supported standards and Request for Comments

This chapter lists the standards and Request for Comments (RFC) supported by the switch.

Standards

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

- IEEE 802.1D (Spanning Tree Protocol)
- IEEE 802.3 (Ethernet)
- IEEE 802.1Q (Virtual Local Area Network, VLAN, Tagging)
- IEEE 802.1p (Prioritizing)
- IEEE 802.1X (Extensible Authentication Protocol over LAN, EAPOL)
- IEEE 802.3u (Fast Ethernet)
- IEEE 802.3z (Gigabit Ethernet)
- IEEE 802.3ab (Gibabit Ethernet over Copper)
- IEEE 802.3x (Flow Control)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.1ab (Link Layer Discovery Protocol)

RFCs

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

- RFC 318 / 854 / 861 / 2941 / 2942 (Telnet)
- RFC 768 (UDP)
- RFC 791 (IP)

- RFC 792 (ICMP)
- RFC 793 (TCP)
- RFC 826 (ARP)
- RFC 854 (Telnet)
- RFC 894 (IP over Ethernet)
- RFC 951 (BootP)
- RFC 1112 (IGMPv1)
- RFC 1157 (SNMP)
- RFC 1213 (MIB-II)
- RFC 1271/1757/2819 (RMON
- RFC 1320 (MD4 Message-Digest Algorithm)
- RFC 1350 (TFTP)
- RFC 1493 (Bridge MIB)
- RFC 1945 (HTTP v1.0)
- RFC 2131 (DHCP)
- RFC 2236 (IGMPv2)
- RFC 2405 (ESP DES-CBC Cipher Algorithm)
- RFC 2548 (RADIUS Encapsulation of MS-CHAPv1 and MS-CHAPv2)
- RFC 2665 (Ethernet MIB)
- RFC 2674 (Q-BRIDGE-MIB)
- RFC 2737 (Entity MIBv2)
- RFC 2759 (Microsoft PPP CHAP Extensions, Version 2)
- RFC 2863 (Interfaces Group MIB)
- RFC 2865 (RADIUS)
- RFC 3046 (DHCP Relay Agent Information Option)
- RFC 3164 (BSD Syslog Protocol)
- RFC 3174 (US Secure Hash Algorithms (SHA and HMAC-SHA))
- RFC 3315 (DHCP for IPv6)
- RFC 3376 (IGMPv3)
- RFC 3993 (Subscriber-ID Sub-option for DHCP Relay Agent Option)
- RFC 3410 (SNMPv3)
- RFC 3411 (SNMP Frameworks)
- RFC 3412 (SNMP Message Processing)
- RFC 3413 (SNMPv3 Applications)

- RFC 3414 (SNMPv3 USM)
- RFC 3415 (SNMPv3 VACM)
- RFC 4250 / 4251 / 4252 / 4253 / 4254 (SSH)
- RFC 4271 (BGP-4)
- RFC 4273 (Definitions of Managed Objects for BGP-4)
- RFC 4757 (RC4–HMAC Kerberos Encryption Types Used by Microsoft)

Chapter 8: Quick reference for basic ACLI tasks

Use this chapter as a quick reference for frequently used Avaya Command Line Interface (ACLI) tasks.

For more information about using ACLI, see User interface fundamentals on page 13.

For detailed configuration information, see the function-specific configuration documents for this product.

For a list of documents, see *Documentation Reference for Avaya Ethernet Routing Switch 5000 Series*, NN47200–103.

Connect to the switch

Switch connection options are

- remote
- console

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

Table 18: Switch access methods

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 the ACLI, choose Command Line Interface from the main menu.

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

Table 19: Prompt commands

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

ACLI command modes

ACLI provides command modes to separate basic user tasks from control and management of the switch.

ACLI command modes are

- User Executive (exec mode)
- Privileged Executive (privExec mode)
- Global Configuration (config mode)

- Interface Configuration (ifconfig mode)
- Router Configuration (config-router mode)

You must use the correct mode to perform certain functions.

For more information about ACLI, see ACLI concepts on page 13.

Use factory default configuration

To restart the switch using the factory default configuration, perform the commands in the following table.

Table 20: Switch restart configuration command

Command	Purpose
`exit`	Exit the configuration mode
`boot default`	Return a switch, or switches, to factory default configuration
`boot partial-default`	Return a switch, or switches, to factory default configuration without losing the IP information, license information, and passwords for console and Telnet/WEB.

Configure the management IP address

To configure and verify the Management IP Address, perform the commands in the following table.

Table 21: Management IP address configuration commands

Command	Purpose
`ip address <IP> netmask <mask>`	Set the management IP and mask
`ip default-gateway <default gateway IP>`	Set the default gateway IP address
`ping <default gateway IP>`	Verify connectivity
`show ip`	Verify configuration

Configure Simple Network Management Protocol (SNMP)

To configure SNMP, perform the commands in the following table.

Table 22: SNMP configuration commands

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
`snmp-server location "<Building & Closet #>`	Set building name and closet information
`snmp-server name "<switch IP address>"`	Maintain coherent Syslog messages
`snmp-server host <host IP> <community>`	Set IP address of trap receiver
`show sys-info`	Verify configuration
`show snmp host`	Verify configuration

Configure VLANs and tagged uplinks

To configure Virtual Local Area Networks (VLAN) and tagged uplinks, perform the commands in the following table.

Table 23: VLANs configuration commands

Command	Purpose
`Vlan configcontrol automatic`	Automatically delete old VLANs and update PVID after you add a VLAN to an untagged port (the setting appears at the bottom of the VLAN configuration information).
`vlan ports <uplink port> tagging tagall`	Enable tagging on the uplink.
`vlan ports <uplink port> filter-untagged-frame enable`	Discard untagged frames.
`vlan ports ALL filter-unregistered-frame disable`	Break Spanning Tree Protocol (STP) for Voice over Internet Protocol (VoIP).
`vlan create <VID> type port`	Create the port based VLAN and assign the 802.1q identifier.
`vlan name <VID> <name>`	Name the VLAN according to conventions.
`vlan members add <VID> <port listing>`	Add ports to appropriate VLANs.
`vlan mgmt <VID>`	Set the management VLAN.
`vlan members remove 1 ALL`	Remove all ports from VLAN 1.
`vlan ports <uplink port> pvid <VID>`	Set the PVID on the uplink.
`show vlan`	Verify VLAN configuration.
`show vlan interface info`	Verify configuration of PVID and port type.

Configure Internet Group Management Protocol (IGMP)

To configure IGMP, perform the commands in the following table.

Table 24: IGMP configuration commands

Command	Purpose
`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

To configure a port, perform the commands in the following table.

Table 25: Port configuration commands

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`	Advertise Gigabit for Gigabit ports because Custom Autonegotiation Advertisements (CANA) is not appropriate for Gigabit ports.
`poe poe-shutdown`	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 learning 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.

Command	Purpose
`qos dhcp snooping enable interface-type access`	Enable Dynamic Host Configuration Protocol (DHCP) Snooping and drop incoming DHCP replies on specified ports.
`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
`qos dhcp snooping enable interface-type core`	Enable DHCP Snooping with DHCP replies.
`Exit`	Terminate uplink configuration.
`show interfaces all`	Display interface settings.

Configure passwords

To configure ACLI passwords, perform the commands in the following table.

Table 26: ACLI password commands

Command	Purpose
`cli password serial local`	Set the switch or stack to use local passwords for serial port access.
`cli password telnet local`	Set the switch or stack to use local passwords for telnet access.
`no password security`	Remove password complexity and change frequency restrictions.
`cli password read-only`	Set the read-only password (you must enter the password twice).

Command	Purpose
`cli password read-write`	Set the read-write password.

Configure Secure Shell (SSH)

To configure SSH, perform the commands in the following table.

Table 27: SSH configuration commands

Command	Purpose
`ssh pass-auth`	Enable password authentication for SSH. To use SSHv2 for switch access, ensure that you use SecureCRT 4.1 or later, Putty, or Linux SSH.
`ssh`	Enable SSH support.
`show ssh global`	Display SSH settings.

Configure Telnet

To disable Telnet access, at the prompt enter the command:

```
telnet-access disable
```

Configure Simple Network Time Protocol (SNTP)

To configure SNTP, perform the commands in the following table.

Table 28: SNTP configuration commands

Command	Purpose
`sntp server primary address <IP address>`	Set SNTP server address where <IP address> is the address of the SNTP server in decimal notation.
`sntp enable`	Enable SNTP.
`show sntp`	Display SNTP settings SNTP . The SNTP default setting is Greenwich Mean Time (GMT).

Configure log settings

To configure log settings, perform the commands in the following table.

Table 29: Log settings configurations commands

Command	Purpose
`logging volatile latch`	Limits the number of logged messages to 400.
`logging remote address <syslog server IP>`	Set syslog server.
`logging remote level informational`	Log all events.
`logging remote enable`	Enable syslogging.

Configure Secure Socket Layer (SSL)

To configure SSL, perform the commands in the following table.

Table 30: SSL configuration commands

Command	Purpose
`ssl certificate`	Create a certificate for use on the next startup or SSL reset. For switches that include a secure Web server (for example, Avaya Ethernet Routing Switch 5698), Avaya recommends that you replace the generic certificate with a new certificate generated by the **`ssl certificate`** command.
`ssl`	Enables SSL server.
`show ssl`	Displays SSL settings.

Configure access control

To configure access control, perform the commands in the following table.

Table 31: Access control configuration commands

Command	Purpose
`ipmgr source-ip 1 <trusted net> mask <mask>`	Enables management from the trusted net.
`ipmgr source-ip 2 <trusted net2> mask <mask>`	Enables management from trusted net 2.
`show ipmgr`	Displays access control configuration.

Enable ACLI as the default interface

To designate ACLI as the default interface, perform the commands in the following table.

Table 32: Default interface commands

Command	Purpose
`exit`	Exit configuration mode to return to the enable prompt.
`cmd-interface cli`	Set ACLI as the default command interface.

Disable the switch front user interface/mode select button

To disable the **UI** button on the switch front, at the prompt enter the command:

```
No ui-button enable
```

Note:

The **UI** button is labeled **Mode Select** on Avaya branded equipment.

Check a configuration

To display the switch configuration, at the prompt enter the command: **`show running-config`**

Glossary

Avaya command line interface (ACLI)	A textual user interface. When you use ACLI, you respond to a prompt by typing a command. After you enter the command, you receive a system response.
Border Gateway Protocol (BGP)	An inter-domain routing protocol that provides loop-free inter-domain routing between Autonomous Systems (AS) or within an AS.
Enterprise Device Manager (EDM)	A Web-based embedded management system to support single-element management. EDM provides complete configuration management functionality for the supported devices and is supplied to the customer as embedded software in the device.
equal cost multipath (ECMP)	Distributes routing traffic among multiple equal-cost routes.
Internet Group Management Protocol (IGMP)	IGMP is a host membership protocol used to arbitrate membership in multicast services. IP multicast routers use IGMP to learn the existence of host group members on their directly attached subnets.
Open Shortest Path First (OSPF)	A link-state routing protocol used as an Interior Gateway Protocol (IGP).
Routing Information Protocol (RIP)	A distance vector protocol in the IP suite, used by IP network-layer protocol, that enables routers in the same AS to exchange routing information by means of periodic updates. You often use RIP as a very simple interior gateway protocol (IGP) within small networks.
Secure Shell (SSH)	SSH uses encryption to provide security for remote logons and data transfer over the Internet.
Secure Sockets Layer (SSL)	An Internet security encryption and authentication protocol for secure point-to-point connections over the Internet and intranets, especially between clients and servers.
Simple Network Management Protocol (SNMP)	SNMP administratively monitors network performance through agents and management stations.
Simple Network Time Protocol (SNTP)	Provides a simple mechanism for time synchronization of the switch to any RFC 2030-compliant Network Time Protocol (NTP) or SNTP server.

Split MultiLink Trunking (SMLT)	An Avaya extension to IEEE 802.1AX (link aggregation), provides nodal and link failure protection and flexible bandwidth scaling to improve on the level of Layer 2 resiliency.
Virtual Local Area Network (VLAN)	A Virtual Local Area Network is a group of hosts that communicate as if they are attached to the same broadcast domain regardless of their physical location. VLANs are layer 2 constructs.
Virtual Router Redundancy Protocol (VRRP)	A protocol used in static routing configurations, typically at the edge of the network. This protocol operates on multiple routers on an IP subnet and elects a primary gateway router. When the primary router fails, a backup router is quickly available to take its place.