



NORTEL

Nortel Ethernet Routing Switch 5000 Series

Fundamentals

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New in this release

The following sections detail what's new in *Nortel Ethernet Routing Switch 5000 Series Fundamentals* (NN47200-104) for Release 6.2.

- ["Features" \(page 11\)](#)
- ["Other changes" \(page 12\)](#)

Features

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

- ["Enterprise Device Manager" \(page 11\)](#)
- ["Cisco CLI commands" \(page 12\)](#)

Enterprise Device Manager

Enterprise Device Manager (EDM) replaces both the Java-based Device Manager and Web-based management. EDM is an embedded element management and configuration application for Ethernet Routing Switch 5000 Series switches. EDM uses a Web-based graphical user interface for the convenience of full integration onto the switch, but it retains the look and feel of Device Manager.

You can use EDM element management to set up, stage, and configure switches and monitor device statistics. To use EDM you require only an internet browser.

EDM is available as

- an embedded, on-box version accessed by a Web browser and available by default on every switch
- an off-box version available as a free, downloadable software plug-in installed on Configuration and Orchestration Manager (COM), purchased separately

The off-box EDM offers the following additional features:

- secure, scalable, high performance element management for an entire network from a centralized management server
- plug-n-play availability based on the device-specific plug-in
- user-based access control with role-based access management for multiple roles, device level read-only or read-write access, fully secured access for multiple enterprise class authentication using applications like RADIUS and Microsoft AD
- audit trails and user-based logs for all configuration activities
- troubleshooting and diagnostic tools including centralized syslog and trap viewer, ping, telnet, CLI*Manager, and PortScan

For information about EDM concepts, see "[Enterprise Device Manager concepts](#)" (page 22). For information about configuring EDM, see "[Enterprise Device Manager procedures](#)" (page 35).

Multiple Port Configuration

Among the many functions available in EDM, you can configure port-specific features for a single port, a group of ports, or all ports. Multiple Port Configuration appears as a pane in the work area wherever this function is available. By default the pane appears and you can close and open it with a click of the task bar. For information about Multiple Port Configuration concepts, see "[Multiple Port Configuration](#)" (page 12). For information about configuring ports with Multiple Port Configuration, see "[Multiple Port Configuration for EDM](#)" (page 32).

Cisco CLI commands

Additional Cisco CLI commands are added to this release.

Other changes

For information about changes that are not feature-related, see the following sections:

- "[Procedure conversion](#)" (page 12)

Procedure conversion

Device manager procedures in this document have been converted to Enterprise Device Manager equivalents.

Introduction

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 NNCLI tasks, is included as a single source for frequently used NNCLI commands.

Navigation

- ["User interface fundamentals" \(page 15\)](#)
- ["Feature licensing fundamentals" \(page 55\)](#)
- ["Configuration files fundamentals" \(page 65\)](#)
- ["Supported standards and Request for Comments" \(page 79\)](#)
- ["Quick reference for basic NNCLI tasks" \(page 81\)](#)

User interface fundamentals

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

Navigation

- ["NNCLI concepts" \(page 15\)](#)
- ["Enterprise Device Manager concepts" \(page 22\)](#)

NNCLI concepts

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

NNCLI 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 NNCLI directly through a console connection, remotely through a dial-up modem connection, or in-band through a Telnet session.

You can use NNCLI interactively or you can load and run NNCLI 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" \(page 68\)](#).

Navigation

- ["NNCLI command modes" \(page 16\)](#)
- ["NNCLI help" \(page 18\)](#)
- ["Opening an NNCLI session" \(page 21\)](#)

NNCLI command modes

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

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

NNCLI command modes are

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

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

If no password is set, you can enter NNCLI 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 NNCLI command mode and the initial access mode. Also known as exec mode, it is the most restrictive NNCLI 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.

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
NNCLI command modes

Command mode and sample prompt	Entrance commands	Exit commands
User Executive 5530-24TFD>	No entrance command, default mode	exit or logout
Privileged Executive 5530-24TFD#	enable	exit or logout
Global Configuration 5530-24TFD(config)#	From Privileged EXEC mode, enter configure	To return to Privileged EXEC mode, enter end or exit To exit NNCLI completely, enter logout

Table 1
NNCLI command modes (cont'd.)

Command mode and sample prompt	Entrance commands	Exit commands
Interface Configuration 5530-24TFD(config-if)#	From Global Configuration mode: To configure a port, enter interface fastethernet <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 NNCLI completely, enter logout
Router Configuration 5530-24TFD(config-router)#	From Interface Configuration mode: To configure RIP, enter router rip To configure OSPF, enter router ospf To configure VRRP, enter router vrrp	To return to Global Configuration mode, enter exit To return to Privileged EXEC mode, enter end To exit NNCLI completely, enter logout

NNCLI help

This section describes help available in NNCLI.

Help is available at all levels of NNCLI.

This section contains information about the following topics:

- ["Obtaining the command list" \(page 18\)](#)
- ["Obtaining command options" \(page 19\)](#)
- ["Obtaining a command name" \(page 19\)](#)
- ["Obtaining NNCLI command modes" \(page 20\)](#)
- ["Obtaining NNCLI commands listed by mode" \(page 20\)](#)
- ["Keystroke shortcuts" \(page 20\)](#)

Obtaining the command list

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 NNCLI commands.

Procedure steps

Step	Action
1	At the prompt, enter a question mark (?).
--End--	

Obtaining command options

NNCLI 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 steps

Step	Action
1	At the prompt, enter a portion of a command followed by a space and a question mark (?).
--End--	

Obtaining a command name

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

Use this procedure to obtain a correct command name.

Procedure steps

Step	Action
1	At the prompt, enter a portion of the command name.
2	Press Tab .
--End--	

Example of obtaining a command name

Procedure steps

Step	Action
1	At the prompt, enter down .
2	Press Tab .

The system displays download.

--End--

Obtaining NNCLI command modes

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

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

Procedure steps

Step	Action
------	--------

1	At the prompt, enter <code>help modes</code> .
---	--

--End--

Obtaining NNCLI commands listed by mode

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

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

Procedure steps

Step	Action
------	--------

1	At the prompt, enter <code>help commands</code> .
---	---

--End--

Keystroke shortcuts

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

The following table describes the keystroke shortcuts.

Table 2
Keystroke shortcuts for NNCLI

Key combination	Function
Ctrl+A	Start of line
Ctrl+B	Back 1 character
Ctrl+C	Abort command

Table 2
Keystroke shortcuts for NNCLI (cont'd.)

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

Opening an NNCLI session

Use this procedure to open an NNCLI session.

Access prerequisites

- 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 NNCLI command station.
- If you use a console cable and console port, ensure that the terminal emulation program conforms to settings in the following table.

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 steps

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

--End--

Enterprise Device Manager concepts

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

Navigation

- ["Supported Web browsers" \(page 23\)](#)
- ["Memory requirements" \(page 24\)](#)
- ["Online help" \(page 24\)](#)
- ["Interface components" \(page 24\)](#)
- ["Enterprise Device Manager procedures" \(page 35\)](#)

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

If you want to manage the switch from a centralized location, using Configuration and Orchestration Manager (COM) 2.0 and higher, Nortel offers optional, product-specific EDM plug-ins for COM that include other features such as centralized syslog, trap viewer, troubleshooting and diagnostic tools. For more information, or to purchase plug-ins, go to www.nortel.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: <ul style="list-style-type: none"> • user and device credential manager • user preference • SSO-based user access control • user-based Device Access Control (read only and read-write) • authentication through third party (RADIUS, Microsoft AD, Sun AM) 	No	Yes
Centralized EM plug-in management (downloadable install and uninstall, upgrade, patch, and inventory view)	No	Yes
User activity log and audit trail	No	Yes
Device performance monitoring and polling	Limited	High performance and low latency
Device-specific single device wizards and template	No	Yes
Centralized syslog and trap viewer	No	Yes
Troubleshooting and diagnostic tools (ping, CLI*Manager, path-trace)	No	Yes

Supported Web browsers

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

- Microsoft Internet Explorer version 7.0
- Mozilla Firefox version 3.0

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 Nortel web site from Help in the Navigation Tree.

For procedures, to go ["EDM online help files for embedded EDM"](#) (page 52), ["Downloading help files"](#) (page 52), ["Configuring the help file path using EDM"](#) (page 54) and ["Configuring the path to the help files using NNCLI"](#) (page 53),

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

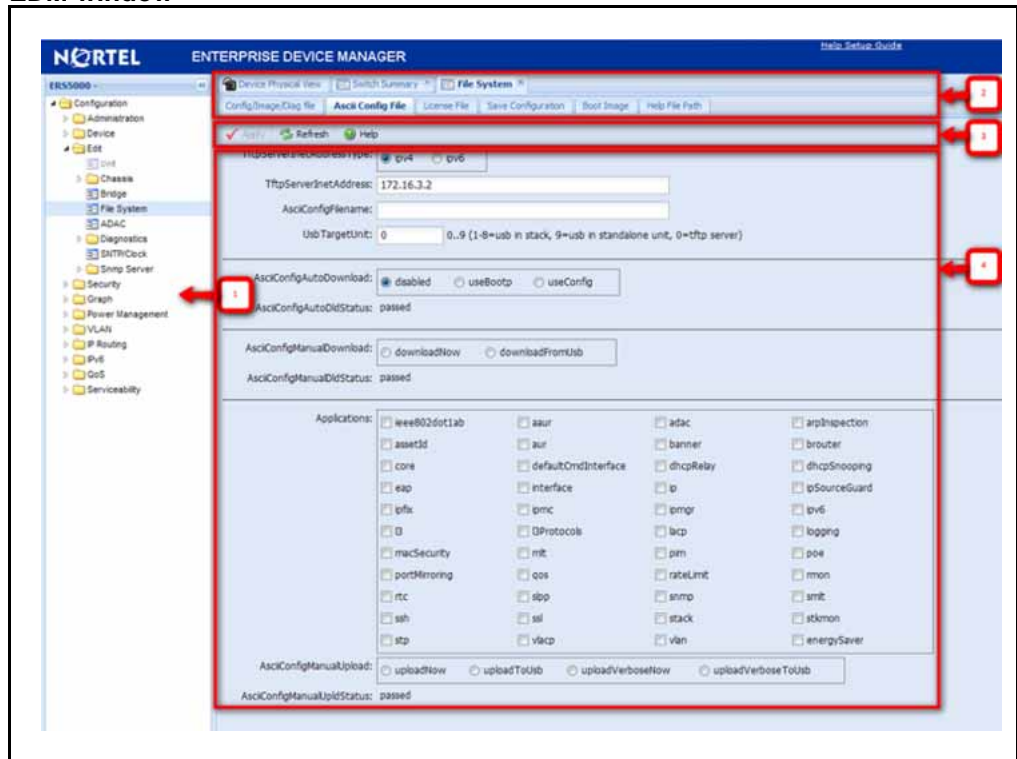


EDM window

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.

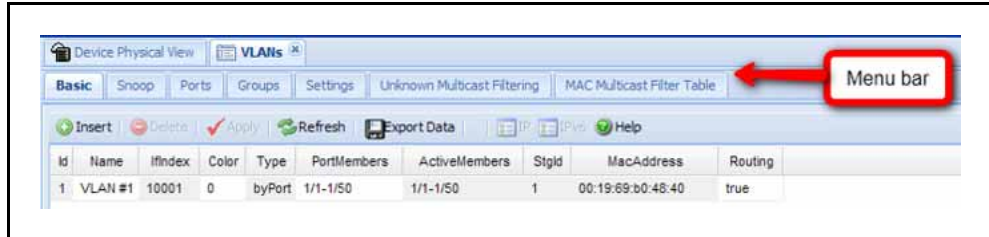
Menu bar

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.

Attention: 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.

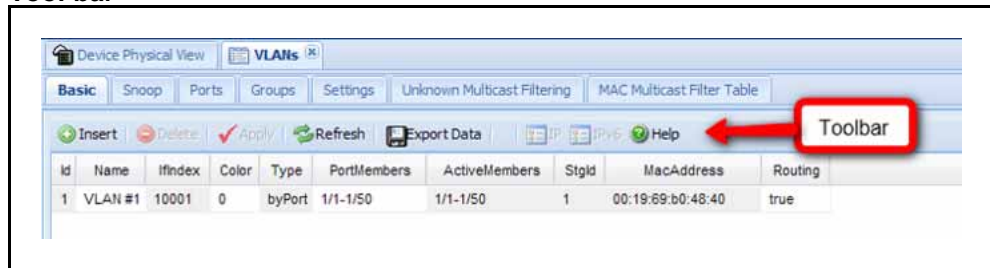
In both rows of the menu bar, arrows can appear on the left and right sides when the number of open tabs exceeds the available space. You can use the arrows to scroll to a tab, or you can select the tab from the navigation tree.

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

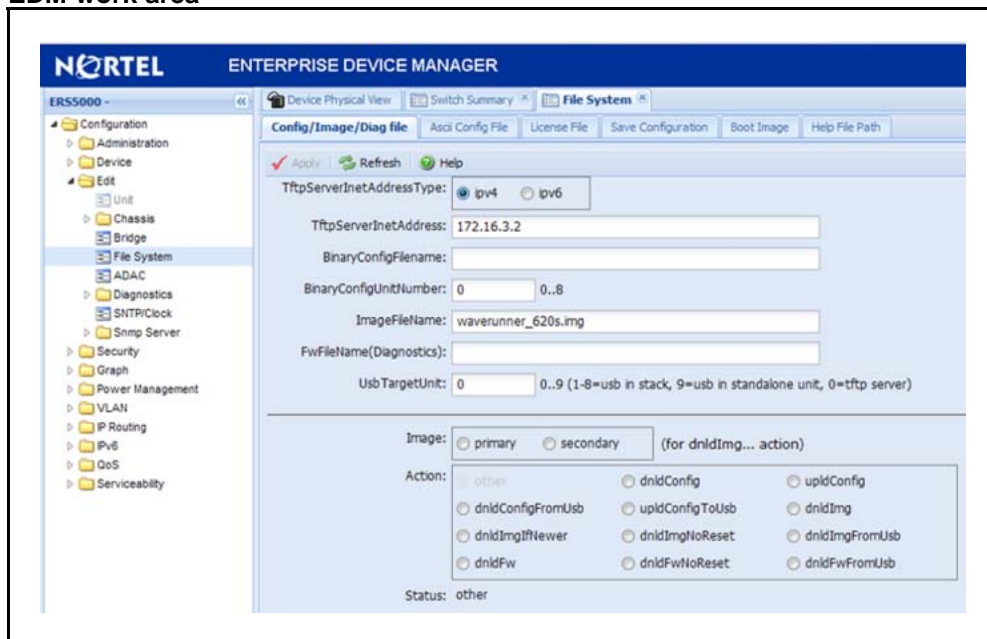
Button	Name	Description
	Apply	Executes parameter changes
	Refresh	Refreshes screen data
	Help	Displays context-sensitive online help for the current dialog box
	Insert	Opens an insert dialog box Submits the entry from the insert dialog box The insert buttons appear only on panes where you can insert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



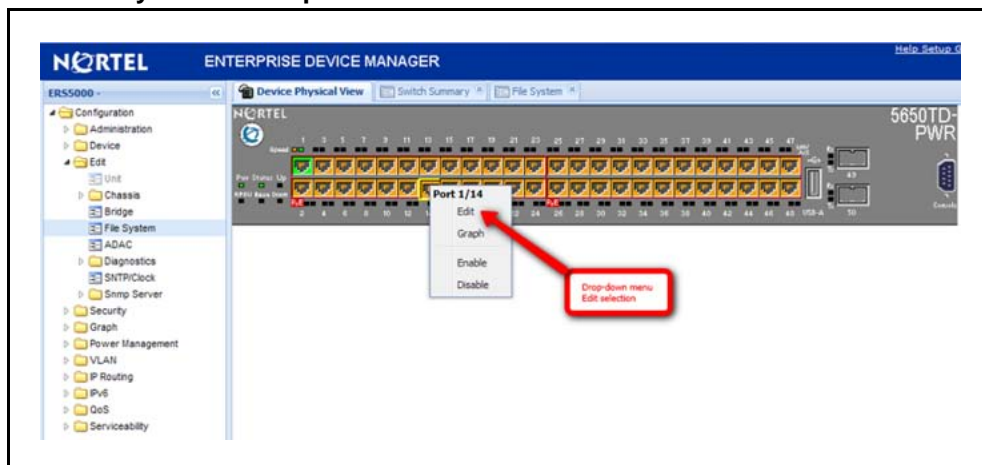
Single port configuration for EDM

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.

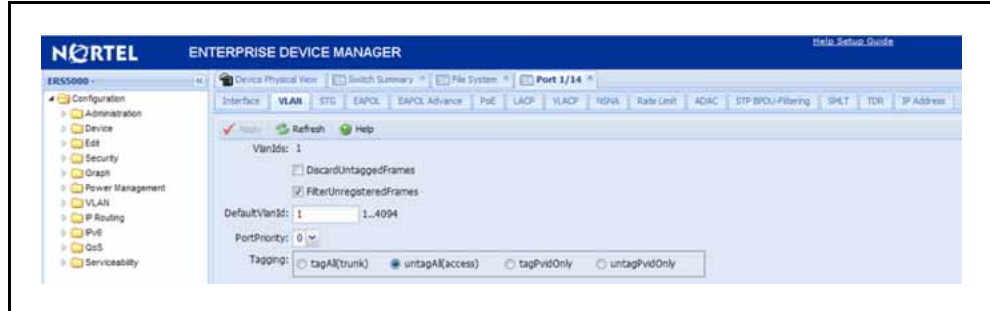
The following figure displays the drop-down menu for the selected port in the Device Physical View.

Figure 6
Device Physical View - port edit



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

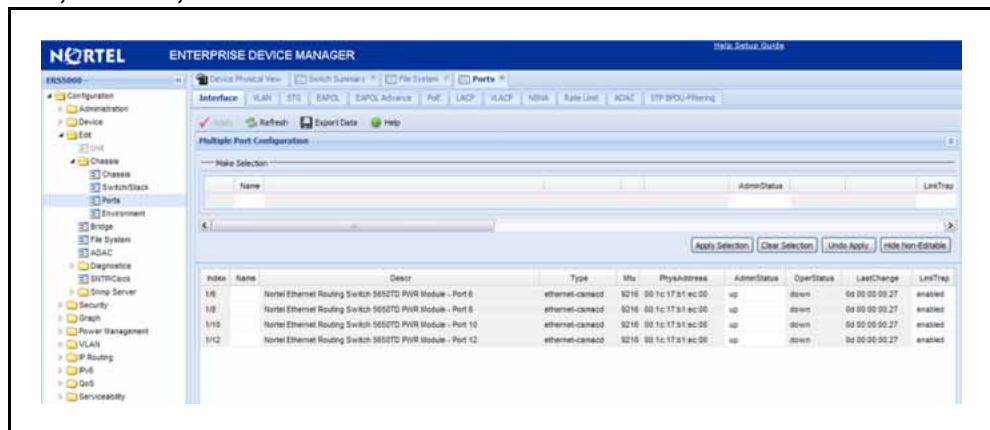
Figure 7
Port edit -VLAN tab



- 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.

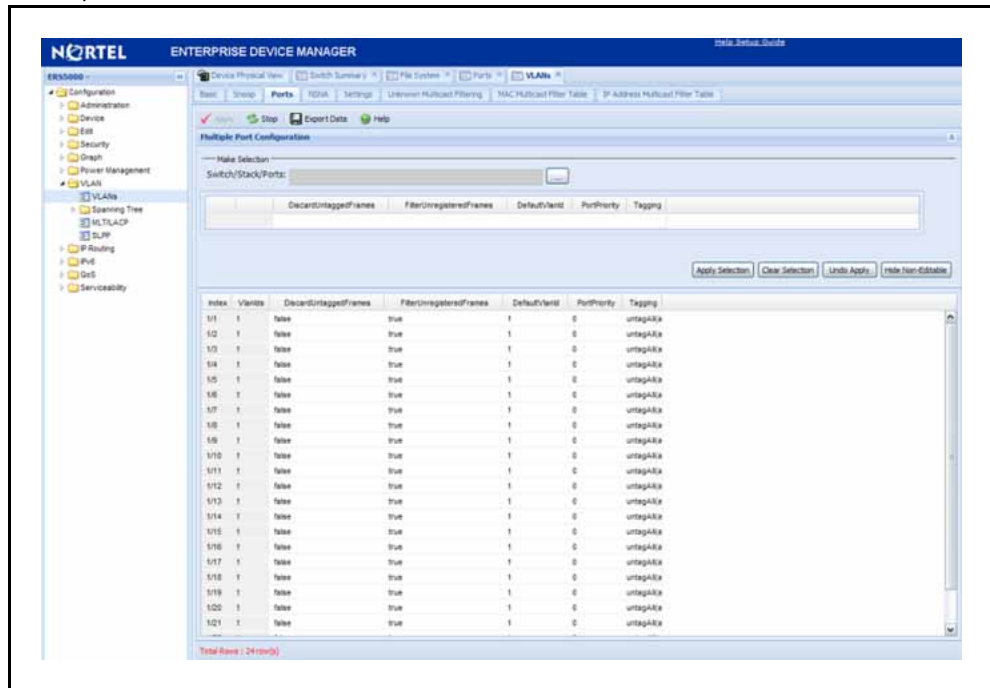
Figure 8
Edit, Chassis, Ports - Interface tab



- 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:

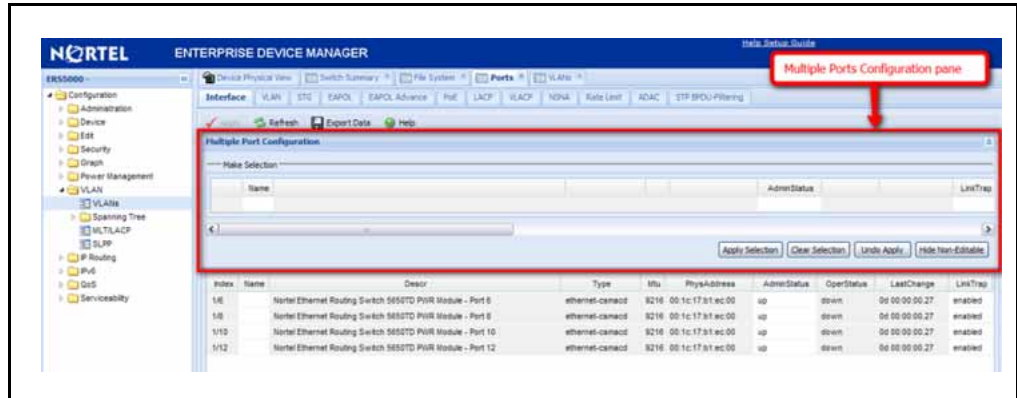
- Hide non-editable fields from the multiple configuration pane so that you choose to view only those fields that can be configured.
- Select an individual port or a group of ports from the Port Editor.
- Select all ports from the Port Editor.

- 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.

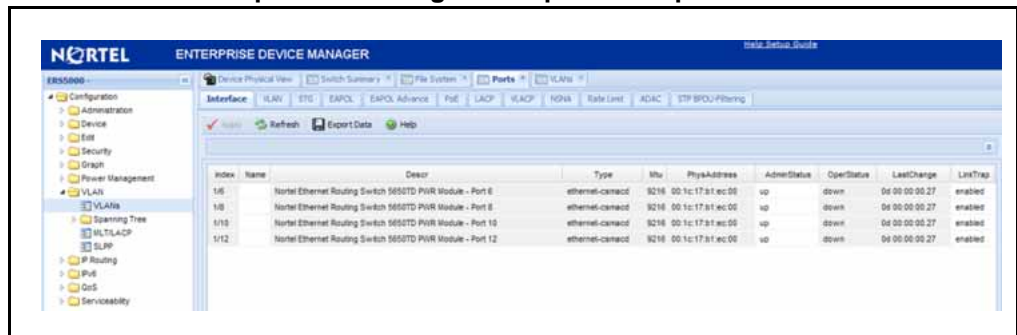
The following figure displays the tabs available in the Edit, Chassis, Ports work flow, with the Interface tab selected and the Multiple Port Configuration pane expanded.

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.

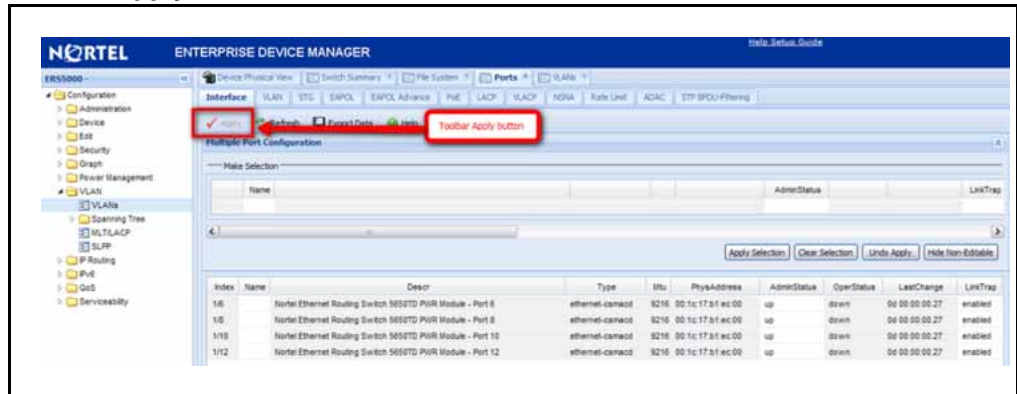
Figure 11
Interface tab - Multiple Port Configuration pane collapsed



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



Enterprise Device Manager procedures

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 NNCLI" \(page 35\)](#)
- ["EDM navigation" \(page 37\)](#)
- ["EDM folders and tabs" \(page 39\)](#)
- ["EDM dialog boxes" \(page 41\)](#)
- ["Graphing statistics" \(page 51\)](#)
- ["EDM online help files for embedded EDM" \(page 52\)](#)

EDM configuration using NNCLI

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

Navigation

- ["Enabling the Web server using NNCLI" \(page 35\)](#)
- ["Disabling EDM using NNCLI" \(page 36\)](#)
- ["Displaying the Web server status using NNCLI" \(page 36\)](#)

Enabling the Web server using NNCLI

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 NNCLI. After you enable the Web server, you can start EDM. For more information about the Web server, see *Nortel Ethernet Routing Switch 5000 Series Configuration – Security* (NN47205-501).

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

Prerequisites

- Open an NNCLI session
- Access Global Configuration mode

Procedure steps

Step	Action
1	Enter the following command: <code>web-server enable</code>

--End--

Disabling EDM using NNCLI

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

Prerequisites

- Open an NNCLI session
- Access Global Configuration mode

Procedure steps

Step	Action
1	Enter the following command: <code>no web-server</code>

--End--

Displaying the Web server status using NNCLI

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

Prerequisites

- Open an NNCLI session
- Access Global Configuration mode

Procedure steps

Step	Action
1	Enter the following command: <code>show web-server</code>
--End--	

Variable definitions

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

EDM navigation

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

Navigation

- ["Starting EDM" \(page 37\)](#)
- ["Using shortcut menus" \(page 38\)](#)
- ["EDM folders and tabs" \(page 39\)](#)

Starting EDM

Use the following procedure to start EDM.

Prerequisites

- 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.

Procedure steps

Step	Action
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**.

--End--

Using shortcut menus

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

Procedure steps

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

--End--

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
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

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

Navigation

- ["Navigating around EDM" \(page 39\)](#)
- ["Undocking tabs" \(page 39\)](#)
- ["Docking tabs" \(page 41\)](#)

Navigating around EDM

Use the following procedure to navigate around EDM.

Procedure steps

Step	Action
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.

--End--

Undocking tabs

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.

Attention: 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.

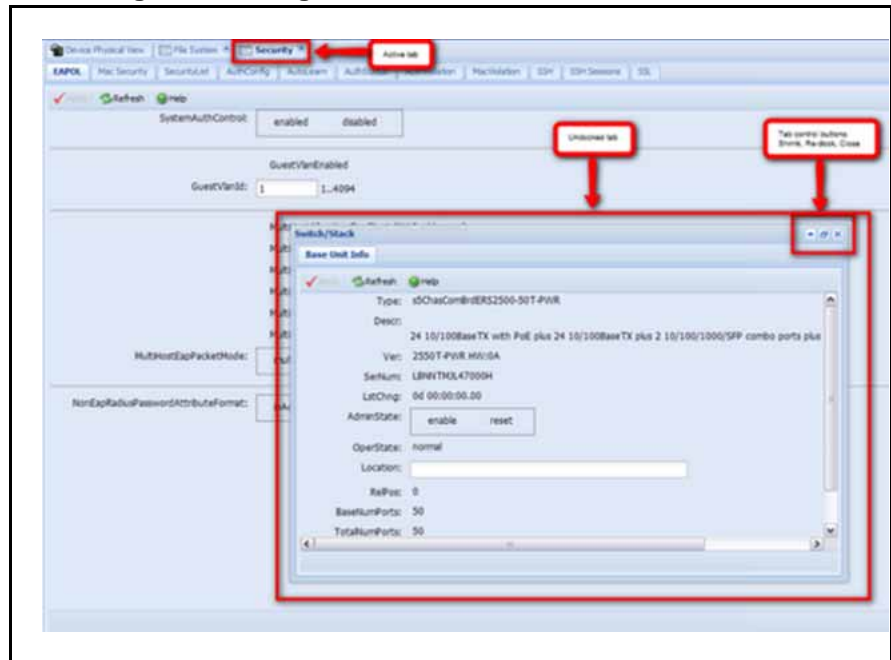
Use the following procedure to undock a tab.

Procedure steps

Step	Action
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



--End--

Docking tabs

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

Procedure steps

Step	Action
1	To re-dock a tab, do one of the following: <ul style="list-style-type: none">• 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
--End--	

EDM dialog boxes

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

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

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

Editable fields in EDM dialog boxes appear in white.

Navigation

- ["EDM dialog box buttons" \(page 41\)](#)
- ["Editing a dialog box" \(page 42\)](#)
- ["Inserting an entry in a dialog box" \(page 43\)](#)
- ["Deleting an entry from a dialog box" \(page 43\)](#)

EDM dialog box buttons

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

Table 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.
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	Export 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

Use the following procedure to edit a dialog box.

Procedure steps

Step	Action
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.
<hr/> <p>Attention: 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.</p> <hr/>	
3	Click Apply .
<hr/> <p>--End--</p> <hr/>	

Inserting an entry in a dialog box

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

Procedure steps

Step	Action
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.
<hr/> <p>--End--</p> <hr/>	

Deleting an entry from a dialog box

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

Procedure steps

Step	Action
1	Highlight the entry.

- 2 Click **Delete**.

--End--

EDM Object configuration

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" \(page 44\)](#)
- ["Editing file system elements" \(page 44\)](#)
- ["Example - Configuring multiple Interface ports" \(page 49\)](#)

Editing an object using the shortcut menu

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

Procedure steps

Step	Action
1	On the Device Physical View, you can <ul style="list-style-type: none">• 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 .

--End--

Editing file system elements

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

Procedure steps

Step	Action
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" (page 65) and "Feature licensing fundamentals" (page 55).

--End--

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	<p>Use the tabs associated with the sub-folders in the Administration folder to perform the following functions:</p> <ul style="list-style-type: none"> • 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

Table 8
Job aid, folders and subfolders in the navigation tree (cont'd.)

Folder	Description
Device	Rediscover Device—Use the Rediscover Device selection to refresh the session. Caution: all existing tabs are lost
Edit	<p>Use the tabs associated with the sub-folders in the Edit folder to view or change parameters for the currently-selected object.</p> <p>Sub-folders in the Edit folder are</p> <ul style="list-style-type: none"> • 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	<p>Use the tabs associated with the sub-folders in the Security folder to view or change security settings.</p> <p>Sub-folders in the Security folder are</p> <ul style="list-style-type: none"> • MAC Security • DHCP Snooping • Dynamic ARP Inspection (DAI) • IP Source Guard (IPSG) • 802.1X/EAP • Web/Telnet/Console • SSH/SSL • RADIUS • NSNA

Table 8
Job aid, folders and subfolders in the navigation tree (cont'd.)

Folder	Description
	<ul style="list-style-type: none"> • TACACS+
Graph	<p>Use the tabs associated with the sub-folders in the Graph folder to view statistics and produce graphs of the statistics.</p> <p>Sub-folders in the Graph folder are</p> <ul style="list-style-type: none"> • Chassis • Port—to view or graph statistics for a port, first select a port on the Device Physical View.
Power Management	<p>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.</p> <p>Sub-folders in the Power Management folder are</p> <ul style="list-style-type: none"> • PoE • Energy Saver <p>PoE is only available for switches equipped with Power over Ethernet.</p>
VLAN	<p>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.</p> <p>Sub-folders in the VLANs folder are</p> <ul style="list-style-type: none"> • VLANs • Spanning Tree: Globals, STG, RSTP, MSTP • MLT/LACP • SLPP

Table 8
Job aid, folders and subfolders in the navigation tree (cont'd.)

Folder	Description
IP Routing	<p>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</p> <ul style="list-style-type: none"> • IP • TCP/UDP • OSPF • RIP • VRRP • Multicast • IGMP • PIM • DHCP • UDP Forwarding • Policy
IPv6	<p>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</p> <ul style="list-style-type: none"> • IPv6 • TCP/UDP • Tunnel • DHCP Relay
QoS	<p>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</p> <ul style="list-style-type: none"> • QoS Devices • QoS Rules • QoS • QoS Agent • QoS NSNA/UBP/Traffic Profile

Table 8
Job aid, folders and subfolders in the navigation tree (cont'd.)

Folder	Description
Serviceability	<p>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.</p> <p>Sub-folders in the Serviceability folder are</p> <ul style="list-style-type: none"> • IPFIX • RMON: Alarms, Control

Example - Configuring multiple Interface ports

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


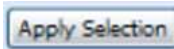
Procedure steps

Step	Action
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: <ul style="list-style-type: none"> • Select a value from the list. • Type a value in the cell.

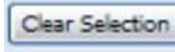
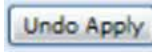
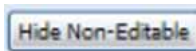
- 9 In the Make Selection pane, click **Apply Selection**.
The changes appear in the table.
- 10 On the Interface tab toolbar, click **Apply** to apply the changes to the switch configuration.

--End--

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		<p>Provides a list of all ports on the switch or stack.</p> <ul style="list-style-type: none"> • Click OK to accept port selections and return to the Multiple Port Configuration pane. • Click Cancel to return to the Multiple Port Configuration pane. • Click All to select all ports and return to the Multiple Port Configuration pane.
Apply Selection		Applies port selections and parameter changes to the Multiple Port Configuration pane and the port data table for review.



Button or dialog name	Button or dialog	Description
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 are editable in the Multiple Port Configuration pane for the selected ports.

Graphing statistics

Use the following procedure to graph statistics for an entire device, a group of ports, or a single port

Procedure steps

Step	Action
1	On the Device Physical View select one of the following: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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.
--End--	

EDM online help files for embedded EDM

Because help files are not included with the embedded EDM software files on the switch, you need to download the help files to a TFTP destination and use NNCLI 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" \(page 52\)](#)
- ["Configuring the path to the help files using NNCLI" \(page 53\)](#)
- ["Configuring the help file path using EDM" \(page 54\)](#)

Downloading help files

Use the following procedure to download help files.

Prerequisites

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



CAUTION

Do not install EDM help files on PCMCIA or Flash.

Procedure steps

Step	Action
1	To obtain EDM help files for the embedded element manager, do one of the following: <ul style="list-style-type: none"> • From the Navigation tree, double-click Help, click Support Portal (Nortel Legacy) and locate the help files for the appropriate product. • Go to the Nortel Web site www.nortel.com and locate the help files for the appropriate product. • Select the help file from the software CD ROM.
2	Do one of the following: <ul style="list-style-type: none"> • 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.

--End--

Configuring the path to the help files using NNCLI


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

Procedure steps

Step	Action
1	Open an NNCLI session.
2	Enter the Global Configuration mode.
3	At the command prompt, enter the following NNCLI command: <code>edm help-file-path <path name> <tftp address usb> <filename></code>

--End--

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	<p>Specifies EDM TFTP server IP address.</p> <p>Use this address only for EDM help files.</p> <p>If you do not specify a TFTP server address, the system uses the address specified most recently.</p> <div style="border: 1px solid black; padding: 5px;">  <p>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.</p> </div>
usb <unit>	Specifies the unit number where the USB mass storage device that

Field	Description
	contains the help files resides. The unit number is an integer from 1–8.

Configuring the help file path using EDM

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

Procedure steps

Step	Action
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.

--End--

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" \(page 55\)](#)
- ["License file generation" \(page 57\)](#)
- ["License file installation" \(page 60\)](#)
- ["License file transfer" \(page 63\)](#)

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, Nortel Ethernet Routing Switches support

- an Advanced License
- a Trial License

Licenses support the following features:

- 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)

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

- purchase an Advanced License Kit
- generate a license file on the Nortel 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 Nortel Web site. Configure Trial License Support through Nortel Command Line Interface (NNCLI) 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. Nortel 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).
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 Nortel licensing portal at www.nortellicensing.com. The Nortel 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, Nortel 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	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	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	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	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

Use this procedure to generate a license file.

Prerequisites

- Purchase a License Kit containing a License Certificate with a License Authorization code (LAC). For more information, contact your Nortel 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 NNCLI 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:

Procedure steps

Step	Action
1	Use a Web browser to go to the Nortel licensing portal at www.nortellicensing.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**.

--End--

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 Nortel 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 NNCLI" \(page 60\)](#)
- ["Displaying an existing software license using NNCLI" \(page 61\)](#)
- ["Deleting an existing license using NNCLI" \(page 62\)](#)
- ["Installing a license file using Enterprise Device Manager" \(page 62\)](#)

Installing a license file using NNCLI

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

Attention: 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).

Prerequisites

- 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.

Procedure steps

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

Attention: Nortel recommends that you schedule switch restart during a normal maintenance window.

--End--

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 NNCLI

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

Procedure steps

Step	Action
1	At any command prompt, enter: <code>show license { <1-10> all }</code>
--End--	

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 NNCLI

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <code>clear license { <1-10> all }</code>
--End--	

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

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

Procedure steps

Step	Action
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 **LicenseFileAction**, select **dnldLicense**.
- 8 Click **Apply**.
- 9 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.

--End--

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
LicenseFile Action	Select dnldLicense to download the license file

License file transfer

Licensing Auto Unit Replacement (AUR) is available on 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 Nortel Licensing portal:

- replacement of a failed non base unit (NBU)
- incorrect MAC address entered on the Nortel 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 Nortel Technical Support to obtain a new LAC

Use the following procedure to transfer a license.

Transferring a license

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

Procedure steps

Step	Action
1	In the Web browser, go to the Nortel licensing portal at www.nortellicensing.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 Nortel Technical Support.
12	After the system displays <i>MAC swap successful</i> , click Return to License Bank Details .
13	Select the transaction that contains the license file name with the new MAC address.
14	Click Download .

--End--

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

- ["NNCLI configuration files" \(page 65\)](#)
- ["Enterprise Device Manager configuration files" \(page 69\)](#)

NNCLI 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 Nortel Networks Command Line Interface (NNCLI). Procedures for Universal Serial Bus (USB) devices apply only to switch models with USB ports.

Navigation

- ["Viewing the current configuration" \(page 66\)](#)
- ["Saving the current configuration" \(page 66\)](#)
- ["Saving the current configuration to flash memory" \(page 66\)](#)
- ["Restoring a system configuration from a USB device" \(page 67\)](#)
- ["Restoring a system configuration from a TFTP server" \(page 67\)](#)
- ["Copying a stack unit configuration to a stand-alone switch" \(page 67\)](#)
- ["Downloading a configuration file automatically at startup" \(page 68\)](#)

Viewing the current configuration

Use this procedure to display the current configuration.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <code>show running-config</code>
--End--	

Saving the current configuration

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <code>copy running-config {tftp (usb) [u2]} address <A.B.C.D> filename <name></code>
--End--	

Variable definitions

Table 15
Copy running config command parameters

Variable	Value
<code>address <A.B.C.D></code>	Specifies the TFTP server IP address.
<code>filename <name></code>	Specifies the configuration file name.
<code>{tftp usb}</code>	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

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <code>copy config nvram</code>
--End--	

Restoring a system configuration from a USB device

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <code>copy usb config filename <name></code>
--End--	

Restoring a system configuration from a TFTP server

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <code>copy tftp config address <A.B.C.D> filename <name></code>
--End--	

Copying a stack unit configuration to a stand-alone switch

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <pre>copy tftp config address <A.B.D.C> filename <name> unit <unit number></pre>
--End--	

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

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

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: <pre>configure network load-on-boot {disable use-bootp use-config} address <A.B.C.D> filename <name></pre>
--End--	

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

Variable	Value
	for the TFTP address and file name. If you 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.

Navigation

- "Storing the current ASCII configuration file on a TFTP server using EDM" (page 71)
- "Storing the current ASCII configuration file on a USB device using EDM" (page 72)
- "Downloading an ASCII configuration file from a TFTP server using EDM" (page 72)
- "Downloading an ASCII configuration file from a USB device using EDM" (page 73)
- "Downloading an ASCII configuration file automatically using EDM" (page 73)
- "Storing a binary configuration file on a TFTP server using EDM" (page 74)
- "Storing a binary configuration file on a USB device using EDM" (page 74)
- "Downloading a binary configuration file from a TFTP server using EDM" (page 74)
- "Downloading a binary configuration file from a USB device using EDM" (page 75)
- "Saving the current configuration to flash memory manually using EDM" (page 75)
- "Config/Image/Diag file tab field descriptions job aid" (page 76)

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

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

Procedure steps

Step	Action
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**.

--End--

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

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

Procedure steps

Step	Action
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 TftpServerIpAddress , 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 .

--End--

Downloading an ASCII configuration file from a TFTP server using EDM

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

Procedure steps

Step	Action
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 TftpServerIpAddress , 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 .

--End--

Downloading an ASCII configuration file from a USB device using EDM

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

Procedure steps

Step	Action
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 .

--End--

Downloading an ASCII configuration file automatically using EDM

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

Procedure steps

Step	Action
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 .

--End--

Storing a binary configuration file on a TFTP server using EDM

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

Procedure steps

Step	Action
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 .

--End--

Storing a binary configuration file on a USB device using EDM

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

Procedure steps

Step	Action
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 .

--End--

Downloading a binary configuration file from a TFTP server using EDM

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

Procedure steps

Step	Action
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 .

--End--

Downloading a binary configuration file from a USB device using EDM

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

Procedure steps

Step	Action
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 .

--End--

Saving the current configuration to flash memory manually using EDM

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

Procedure steps

Step	Action
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.

--End--

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	<p>dnldConfigFromUSB—download a configuration to the switch from a USB device</p> <p>dnldImgIfNewer—download a new software image to the switch only if it is newer than the current image</p> <p>dnldFw—download a new diagnostic software image to the switch</p> <p>dnldConfig—download a configuration file to the switch</p> <p>upldConfigToUsb—upload a configuration file to a USB device</p> <p>dnldImgNoReset—download a new software image to the switch without a switch reset</p> <p>dnldFwNoReset—download a new diagnostic software image to the switch without a switch reset</p>

Field name	Description
	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.

Supported standards and Request for Comments

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

Navigation

- ["Standards" \(page 79\)](#)
- ["RFCs" \(page 79\)](#)

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 (Gigabit 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 791 (IP)
- RFC 894 (IP over Ethernet)

- RFC 792 (ICMP)
- RFC 793 (TCP)
- RFC 1350 (TFTP)
- RFC 826 (ARP)
- RFC 768 (UDP)
- RFC 854 (Telnet)
- RFC 951 (BootP)
- RFC 1213 (MIB-II)
- RFC 1493 (Bridge MIB)
- RFC 2131 (DHCP)
- RFC 2863 (Interfaces Group MIB)
- RFC 2665 (Ethernet MIB)
- RFC 2737 (Entity MIBv2)
- RFC 2819 (RMON MIB)
- RFC 1757 (RMON)
- RFC 1271 (RMON)
- RFC 1157 (SNMP)
- RFC 1112 (IGMPv1)
- RFC 2236 (IGMPv2)
- RFC 1945 (HTTP v1.0)
- RFC 2865 (RADIUS)
- RFC 2674 (Q-BRIDGE-MIB)
- RFC 3046 (DHCP Relay Agent Information Option)
- RFC 3164 (BSD Syslog Protocol)
- RFC 3315 (DHCP for IPv6)
- RFC 3993 (Subscriber-ID Sub-option for DHCP Relay Agent Option)
- RFC 3410 (SNMPv3)
- RFC 3411 (SNMP Frameworks)
- RFC 3413 (SNMPv3 Applications)
- RFC 3414 (SNMPv3 USM)
- RFC 3415 (SNMPv3 VACM)
- RFC 3412 (SNMP Message Processing)

Quick reference for basic NNCLI tasks

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

For more information about using NNCLI, see ["User interface fundamentals" \(page 15\)](#).

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

For a list of documents, see *Nortel Ethernet Routing Switch 5000 Series Documentation Roadmap* (NN47200-103).

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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 NNCLI from the main menu

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

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

Table 19
Prompt commands

Command	Purpose
<code>enable</code>	Enter configuration mode
<code>config t</code>	Start configuration

NNCLI command modes

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

NNCLI 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 NNCLI, see "NNCLI concepts" (page 15).

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
<code>exit</code>	Exit the configuration mode
<code>boot default</code>	Return a switch, or switches, to factory default configuration

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
<code>ip address</code> <code><IP> netmask</code> <code><mask></code>	Set the management IP and mask
<code>ip default-gatewa</code> <code>y</code> <code><default gateway</code> <code>IP></code>	Set the default gateway IP address
<code>ping</code> <code><default gateway</code> <code>IP></code>	Verify connectivity
<code>show ip</code>	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
<code>snmp-server</code> <code>enable</code>	Enable SNMP (the default setting is disabled)
<code>snmp-server auth</code> <code>entication-trap</code> <code>enable</code>	Enable authentication traps

Table 22
SNMP configuration commands (cont'd.)

Command	Purpose
<code>snmp-server community ro</code>	Set the read-only community name (requirement: enter community string twice)
<code>snmp-server community rw</code>	Set the read-write community name (requirement: enter community string twice)
<code>snmp-server contact "whatever you want"</code>	Set contact information
<code>snmp-server location "<Building & Closet #>"</code>	Set building name and closet information
<code>snmp-server name "<switch IP address>"</code>	Maintain coherent Syslog messages
<code>snmp-server host <host IP> <community></code>	Set IP address of trap receiver
<code>show sys-info</code>	Verify configuration
<code>show snmp host</code>	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
<code>vlan configcontrol automatic</code>	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).
<code>vlan ports <uplink port> tagging tagall</code>	Enable tagging on the uplink.
<code>vlan ports <uplink port> filter-untagged-frame enable</code>	Discard untagged frames.
<code>vlan ports ALL filter-unregistered-frame disable</code>	Break Spanning Tree Protocol (STP) for Voice over Internet Protocol (VoIP).

Table 23
VLANs configuration commands (cont'd.)

Command	Purpose
<code>vlan create <VID> type port</code>	Create the port based VLAN and assign the 802.1q identifier.
<code>vlan name <VID> <name></code>	Name the VLAN according to conventions.
<code>vlan members add <VID> <port listing></code>	Add ports to appropriate VLANs.
<code>vlan mgmt <VID></code>	Set the management VLAN.
<code>vlan members remove 1 ALL</code>	Remove all ports from VLAN 1.
<code>vlan ports <uplink port> pvid <VID></code>	Set the PVID on the uplink.
<code>show vlan</code>	Verify VLAN configuration.
<code>show vlan interface info</code>	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
<code>vlan igmp <VID> snooping enable</code>	Enable IGMP snooping on each appropriate VLAN
<code>vlan igmp <VID> proxy enable</code>	Enable IGMP proxy on each appropriate VLAN
<code>show vlan igmp <VID></code>	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
<code>interface fastEthernet <end-user port list></code>	Enter configuration mode at the interface level where you can configure multiple ports, excluding uplink ports, simultaneously.

Table 25
Port configuration commands (cont'd.)

Command	Purpose
<pre>auto-negotiation -advertisements 10-full 10-half 100-full 100-half pause-frame</pre>	Set 10/100 ports to advertise only 10Mb/s half-duplex and 100Mb/s half-duplex.
<pre>default auto-nego tiation-advertis ement</pre>	Advertise Gigabit for Gigabit ports because Custom Autonegotiation Advertisements (CANA) is not appropriate for Gigabit ports.
<pre>poe poe-shutdown</pre>	Power Over Ethernet (PoE) is on by default; use this command to disable PoE on non-PoE ports.
<pre>no poe-shutdown</pre>	Enable PoE for AP ports.
<pre>shutdown <port></pre>	Disable unused ports.
<pre>spanning-tree learning fast</pre>	Set fast spanning tree learning on access ports.
<pre>name <port name></pre>	Name uplink ports. If you need dual uplinks, Nortel recommends that you add a second switch, in a stack, and use port 48 of the second switch as the second uplink.
<pre>qos dhcp snooping enable interface- type access</pre>	Enable Dynamic Host Configuration Protocol (DHCP) Snooping and drop incoming DHCP replies on specified ports.
<pre>Exit</pre>	Terminate port configuration.
<pre>interface fastEthernet <uplink port></pre>	Enter configuration mode at the interface level to configure port 48 as an uplink port .
<pre>speed auto</pre>	Enable autonegotiate.
<pre>spanning-tree learning <normal or disable></pre>	Depending on the upstream switch location, set spanning tree to normal or disabled.
<pre>name UP-<Switch IP Address>-<Slot >/<Port></pre>	Example: UP-128.206.95.254-1/2
<pre>qos dhcp snooping enable interface- type core</pre>	Enable DHCP Snooping with DHCP replies.
<pre>Exit</pre>	Terminate uplink configuration.
<pre>show interfaces all</pre>	Display interface settings.

Configure passwords

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

Table 26
NNCLI password commands

Command	Purpose
<code>cli password serial local</code>	Set the switch or stack to use local passwords for serial port access.
<code>cli password telnet local</code>	Set the switch or stack to use local passwords for telnet access.
<code>no password security</code>	Remove password complexity and change frequency restrictions.
<code>cli password read-only</code>	Set the read-only password (you must enter the password twice).
<code>cli password read-write</code>	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
<code>ssh pass-auth</code>	Enable password authentication for SSH. To use SSHv2 for switch access, ensure that you use SecureCRT 4.1 or later, Putty, or Linux SSH.
<code>ssh</code>	Enable SSH support.
<code>show ssh global</code>	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
<code>sntp server primary address <IP address></code>	Set SNTP server address where <IP address> is the address of the SNTP server in decimal notation.

Table 28
SNTP configuration commands (cont'd.)

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

Configure Secure Socket Layer (SSL)

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

Table 30
SSL configuration commands

Command	Purpose
<code>ssl certificate</code>	Create a certificate for use on the next startup or SSL reset. For switches that include a secure Web server (for example, Ethernet Routing Switch 5510), Nortel recommends that you replace the generic certificate with a new certificate generated by the <code>ssl certificate</code> command.
<code>ssl</code>	Enables SSL server.
<code>show ssl</code>	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
<code>ipmgr source-ip 1 <trusted net> mask <mask></code>	Enables management from the trusted net.
<code>ipmgr source-ip 2 <trusted net2> mask <mask></code>	Enables management from trusted net 2.
<code>show ipmgr</code>	Displays access control configuration.

Enable NNCLI as the default interface

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

Table 32
Default interface commands

Command	Purpose
<code>exit</code>	Exit configuration mode to return to the enable prompt.
<code>cmd-interface cli</code>	Set NNCLI as the default command interface.

Disable the switch front user interface (UI) button

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

```
No ui-button enable
```

Check a configuration

To display the switch configuration, at the prompt enter the command:

```
show running-config
```


Nortel Ethernet Routing Switch 5000 Series

Fundamentals

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